

REVISIONS OF GENERA IN THE *ASTERON*-COMPLEX (ARANEAE: ZODARIIDAE):
NEW GENERA *PENTASTERON*, *PHENASTERON*, *LEPTASTERON* AND *SUBASTERON*

BARBARA BAEHR AND RUDY JOCQUÉ

Baehr, B. & Jocqué, R. 2001 06 30: Revisions of genera in the *Asteron*-complex (Araneae: Zodariidae): new genera *Pentasteron*, *Phenasteron*, *Leptasteron* and *Subasteron*. *Memoirs of the Queensland Museum* 46(2): 359-385. Brisbane. ISSN 0079-8835.

Four genera are erected to accommodate 13 new species in the *Asteron*-complex, a large group of Australian Zodariidae. *Pentasteron* is characterised by a cymbial concavity. Its type species is *simplex* (♂♀) and it is further represented by *parasimplex* (♂), *intermedium* (♂♀), *securifer* (♂♀), *oscutans* (♂♀), *sordidum* (♂), *storosoides* (♂) and *isobetae* (♂♀). *Phenasteron* is created for the type species *longiconductor* (♂) and *machinosum* (♂). *Leptasteron* includes the type species *plaryconductor* (♂) and *vexillum* (♂). Both the later genera are characterised by a sclerotised basal swelling on the subtegulum and a huge DTA with refolded distal margin. They differ mainly by the structure of the carapace, cymbium and tegulum. *Subasteron* contains only the peculiar type species *daviesae* (♂♀) diagnosed by shape of the carapace and of the ♂-abdomen and a prolateral tegular apophysis on the male palp. □ Araneae, Zodariidae, *Asteron*-complex, new genera, Australia.

B. Baehr, Queensland Museum, PO Box 3300, South Brisbane 4101, Australia (e-mail: barbarab@qm.qld.gov.au); R. Jocqué, Invertebrate Section, Royal Africa Museum, B-3080 Tervuren, Belgium (e-mail: jocque@africamuseum.be); 15 February 2001.

This is the third contribution to the systematics of spiders belonging to the large *Asteron*-complex (Baehr & Jocqué, 1996). Jocqué & Baehr (2001) and Baehr & Jocqué (2000) revised *Asteron* Jocqué, 1991, to contain 8 species, and *Pseudasteron*, *Cavasteron* and *Minasteron* were erected with 1, 12 and 3 species, respectively. The present paper describes another 4 genera with 8, 2, 2 and 1 species. Whereas the former genera were fairly easily defined as they exhibit clear autapomorphies, it was much more difficult to unite the species that were placed in the basal groups of the cladogram for the *Asteron*-complex that was presented by Baehr & Jocqué (1996). The original idea was to create *Pentasteron* for the 5 basal groups in the cladogram. It proved, however, that this was impossible due to the lack of synapomorphies for this grouping that would have created a paraphyletic taxon in the absence of *Asteron* s. str. Therefore, we have erected 3 new genera; *Subasteron*, is monotypic whereas *Phenasteron* and *Leptasteron* each contain 2 species united by characters of the male palp and carapace shape.

MATERIAL AND METHODS

Descriptions follow Jocqué & Baehr (1992). Abbreviations: ALE, anterior lateral eyes; AME, anterior median eyes; AS, anterior spinnerets; E, embolus; EA, embolar apophysis; DTA, dorsal tegular apophysis; F, femur; FL, flange; LTA, lateral tegular apophysis; MS, median

spinnerets; MT, metatarsus; MOQ, median eye quadrangle; P, patella; PE, prolateral extension of tegulum; PLE, posterior lateral eyes; PME, posterior median eyes; PS, posterior spinnerets; PTA, prolateral tegular apophysis; T, tibia; VTA, ventral tegular apophysis. Abbreviations of institutions where material was borrowed: AM, Australian Museum, Sydney; KBIN, Koninklijk Belgisch Instituut voor Natuurwetenschappen; QM, Queensland Museum, Brisbane; SAMA, South Australian Museum, Adelaide; VM, Victoria Museum, Melbourne; WAM, Western Australian Museum, Perth; ZSM, Zoologische Staatssammlung Muenchen.

SYSTEMATICS

Pentasteron gen. nov.

TYPE SPECIES, *Pentasteron simplex* sp. nov.

ETYMOLOGY, Greek prefix, *penta* = five; with generic name, *Asteron*; referring to 5 basal groups of *Asteron*-complex (Baehr & Jocqué, 1996). Gender is neuter.

DIAGNOSIS. Member of *Asteron*-complex, with ♂ palp having tibia with a deep retrolateral concavity combined with a pronounced concavity on the base of the cymbium, having tegulum with a broad base traversed by the seminal duct and ending in a typical median apophysis (VTA) with curved tip, usually having embolar apophysis (EA) of variable length.

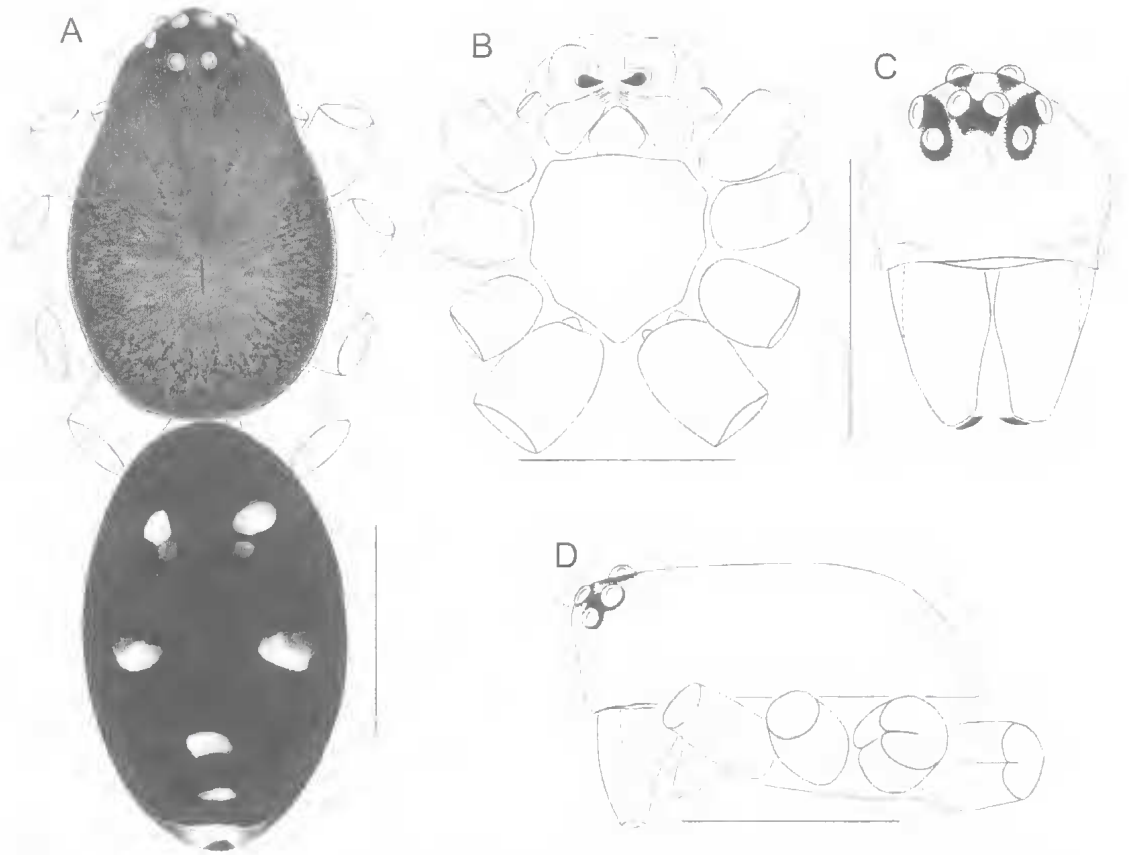


FIG. 1. *Pentasteron simplex*. A, body dorsal; B-D, cephalothorax; B, ventral; C, frontal; D, lateral. Scale 1mm.

DESCRIPTION. Small to medium-sized spiders (3.00-7.00) with slightly granulate tegument. Carapace widest at coxae II, narrowed to 0.60-0.65 maximum width in both sexes. Profile flat with highest point between fovea and PME (Fig. 1A,B).

Colour: carapace dark brown, chelicerae and sternum medium brown; legs with strongly contrasting white to dark brown femora; coxae pale, trochanters dark, other legs yellow or brownish.

Eyes (Fig. 1C, D) in 3 rows (2-4-2). Only ALE in first row, AME (in the middle) and PLE in second, third only PME. Eyes subequal or ALE smaller than rest. MOQ slightly longer than wide. Clypeus straight, about 3 times diameter of ALE; with few hairs. Chilum single, short wide, without setae. Chelicerae as usual for family with a few hairs in front and dense row on distal promargin; no teeth. Labium narrowed at base; sparsely haired. Gnathocoxae rather elongate; sparsely haired; with anteromesal scopula.

Sternum flat; shield-shaped with straight anterior margin and tiny triangular extensions between coxae. No inter- nor precoxal sclerites.

Legs: formula 4123. Spination: few spines on pairs I, II, more numerous on III, IV. Paired tarsal claws with numerous (± 12) teeth on I and II, with ± 7 on III and IV. Unpaired claw toothless, on very small onychium.

Trichobothria in two rows on T, in a single row on Mt and t. Hinged hairs present but few, restricted to dorsal side of TI and II. Metatarsal preening brush on Mt II and III poorly developed.

Abdomen oval; mostly without sigilla but some species with two dorsal and a prolateral one on either side. Spinnerets: AS short, conical, with very short distal segment; MS and PS very short, absent in males. Colulus represented by group of setae. Tracheal spiracle hidden by well developed anterior lip; posterior lip sometimes sclerotised and protruding from under anterior lip.

Male palp (Fig. 2C,D): tibia with large lateral concavity delimited by solid dorsolateral apophysis and ventrolateral apophysis, most often swollen along its lower lateral margin. Cymbium with basal concavity, simple unmodified flange, several spines near distal tip.

Tegulum with broad base carrying transverse section of seminal duct; distal part extended in typical median apophysis (VTA) with curved tip. Embolus emerging on prolateral part of tegulum. Several species with split relatively short, rigid embolus, dorsal prong of variable length. LTA usually short and thorn-like. DTA membranous, simple.

Epigyne: external structure simple, with central depression, sometimes double; copulatory ducts starting near centre or slightly in front, running towards the side and backward to enter simple, thick-walled spermathecae. Female palp with finely dentate claw.

KEY TO THE SPECIES OF *PENTASTERON*

1. Males 2
Females 9
2. Embolus not bifid 3
Embolus bifid (Figs 3F,H, 4C,F,I, prolateral view) . . . 5
3. Tegulum with very large prolateral extension (PE), guiding embolus (Fig. 5A) *P. securifer*
Tegulum without such extension 4
4. Tegulum with large half funnel-shaped VTA (Fig. 5C,D) *P. isobelae*
VTA not half funnel-shaped, but straight (Fig. 3A) *P. parasimplex*
5. Cymbium with very large retro-basal cymbial concavity delimited by triangular flap (Fig. 4B) *P. oscitans*
Cymbium with small concavity (Figs 3D,G, 4E,H) . . . 6
6. EA at base thicker than embolus (Fig. 3H) *P. intermedium*
EA at base not thicker than embolus (Figs 3E, 4F,I) . . . 7
7. EA bifid at distal end; dorsolateral tibial apophysis recurved (Fig. 4D-F) *P. storosoides*
EA not bifid at distal end; dorsolateral tibial apophysis not recurved (Figs 3E, 4I) 8
8. EA longer than embolus, clearly visible in ventral view (Fig. 4G) *P. sordidum*
EA shorter than embolus, not visible in ventral view (Fig. 3C,E) *P. simplex*
9. Central part of epigyne clearly delimited, with inverted v-shaped ridge, or at least rebordered in front (Figs 6E,F, 7A,B) 11
Central part of epigyne poorly delimited, front never rebordered 12
11. Epigyne with inverted u-shaped ridge only in front (Fig. 7A) *P. securifer*
Epigyne with inverted v-shaped ridge for more than half of epigyne (Fig. 6E) *P. intermedium*

12. Posterior margin of epigyne clearly indented (Fig. 6C) *P. oscitans*
Posterior margin sometimes sinuous but not indented (Figs 6A, 7C) 13
13. Posterior margin of epigyne straight (Fig. 7C) *P. isobelae*
Posterior margin of epigyne sinuous (Fig. 6A) *P. simplex*

***Pentasteron simplex* sp. nov.**
(Figs 1A-D, 2A-D, 3C-E, 6A,B, 15)

ETYMOLOGY. For the simple genitalia.

MATERIAL. HOLOTYPE: ♂, Lake Broadwater, via Dalby, SE Qld, pitfalls site 1, 13.i-25.ii.1986, QM & M. Bennie (QMS15746). PARATYPES: Queensland: 58 ♂, 6 ♀, together with holotype (QMS52610); 2 ♂ in KBIN; 1 ♂ 1 ♀ in ZSM); 1 ♂, Christmas Creek, xi.1912. E. Mjöberg (RMS). NSW: 1 ♂, Myall Lakes NP, 32°30'S 152°21'E, 14.xii.1996, L. Wilkie (MLCO/05) (AM KS 55653); 1 ♀, Myall Lakes NP, 32°37'S 152°12'E, 14.xi.1996, L. Wilkie (MLIO/03) (AM KS 55654); 1 ♂, as previous; 32°17'S 152°12'E, 15.xii.1996 (MLIO/01) (AM KS55650); 1 ♀, Myall Lakes NP, 32°37'S 152°12'E, 14.xii.1996, L. Wilkie MLIO/01) (AMKS55651); 1 ♂, 15.xii.1996, further as previous (MLIO/05) (AM KS55652); 3 ♂, Booti Booti NP, 32°16'S 152°31'E, 13.xii.1996, L. Wilkie (BBIO1/09) (AMKS55659); 1 ♂, as previous (BBIO1/06) (AMKS55644); 1 ♀, as previous, (BBIO1/01) (AMKS55645); 1 ♂, as previous (BBIO1/05) (AM KS55648); 1 ♀, as previous, 13.xi.1996 (BBIO2/01) (AM KS55647); 2 ♂, as previous (BBIO1/09) (AM KS55659); 1 ♀, as previous (BBIO01/09) (AMKS55643); 1 ♀, as previous (BBIO2/09) (AMKS55649); 1 ♂, as previous, 32°14'S 152°32'E, 14.xii.1996, L. Wilkie (BBCO2/07) (AM KS55646); 1 ♀, Munmorah State Rec., 33°13'S 151°34'E, 16.xii.1996, L. Wilkie (MUNIO2/04) (AMKS55655); 1 ♀, Wyrabalong NP, 33°16'S 151°32'E, 16.xii.1996, L. Wilkie (WYRCO02/07) (AM KS55658); 1 ♂, as previous, 16.xi.1996 (WYRCO02/10) (AM KS55657); 1 ♂, as previous, 16.xi.1996 (WYRCO01/09) (AM KS55656); 2 ♂, Ramornie SF, Main Ck, track off Mt. Tindal, 29°43'S 152°38'E, 4.ii-9.iii.1993, M. Gray & G. Cassis (AMKS39135); 1 ♂, Ramornie SF, Mt Tindal, 29°42'S 152°35'E, 4.ii-9.iii.1993, M. Gray & G. Cassis (AMKS 39136); 5 ♂ 1 ♀, Ramornie SF, track off T-Ridge Rd, Mt Tindal, 29°33'S 152°38'E, 4.ii-9.iii.1993, M. Gray & G. Cassis (AMKS39134).

DIAGNOSIS. ♂♂ are recognised by simple palpal organs: dorsolateral tibial apophysis with broad base, split embolus with thin and short EA; ♀ epigyne simple with a longitudinal pale zone in middle; the copulatory openings are at margin of this zone just in front of centre.

DESCRIPTION. *Male* (holotype). Total length 3.56; carapace 1.85 long, 1.22 wide; tibia+patella 1.59.

Colour: Carapace medium brown with darker

radiating striae; chelicerae and sternum reddish brown; coxae pale with dark pro- and retrolateral spots; trochanters dark; proximal half of femora white with dark proximal ring, distal half dark brown; patellae brownish yellow suffused with dark brown on sides and with dark distal ring; tibiae brownish yellow, II, III and IV darkened on ventral and lateral sides. Abdomen dark sepia to black; dorsum with narrow dark brown scutum in front and 7 white spots: 2 pairs in anterior half, 3 in a row in front of spinnerets; sides with large oblique white spot; venter uniform dark sepia with 2 small yellow spots in front of epigastric fold.

Carapace finely granulated; sternum not granulated.

Eyes: a: 0.10; b: 0.10; c: 0.11; d: 0.12; e: 0.02; f: 0.02; g: 0.04; h: 0.08; AL-AL: 0.18. MOQ: AW = 0.84 PW; AW = 0.78 L.

Clypeus 0.32 or 3.2 times ALE. Chilum single, 0.08 high, 0.38 wide.

Spination:

	F	P	T	Mt
I	pl1d2	-	v2	v4
II	pl3d2	-	v2	v5 dw3
III	pl2d3rl2	pl1d1rl1	pl2d2rl2v1-2-2	10disp dw5
IV	pl2d4rl1	pl1d1rl1	pl2d2rl2v1-2-2	10disp dw5

No hinged hairs.

Male palp (Fig. 3C-E): tibia with large retrolateral concavity delimited by ventrolateral lamellate apophysis with swollen lateral margin and dorsal, short, blunt downpointing apophysis. Cymbium with shallow basal concavity and fairly long flat flange (FL). Enibolus short, rigid, curved outward, split at base, EA thin, short, only visible from prolateral side. VTA short, sturdy; DTA membranous, attached to dorsal part of VTA.

Female (paratype). Total length 4.31; carapace 1.98 long, 1.35 wide; tibia+patella I: 1.58.

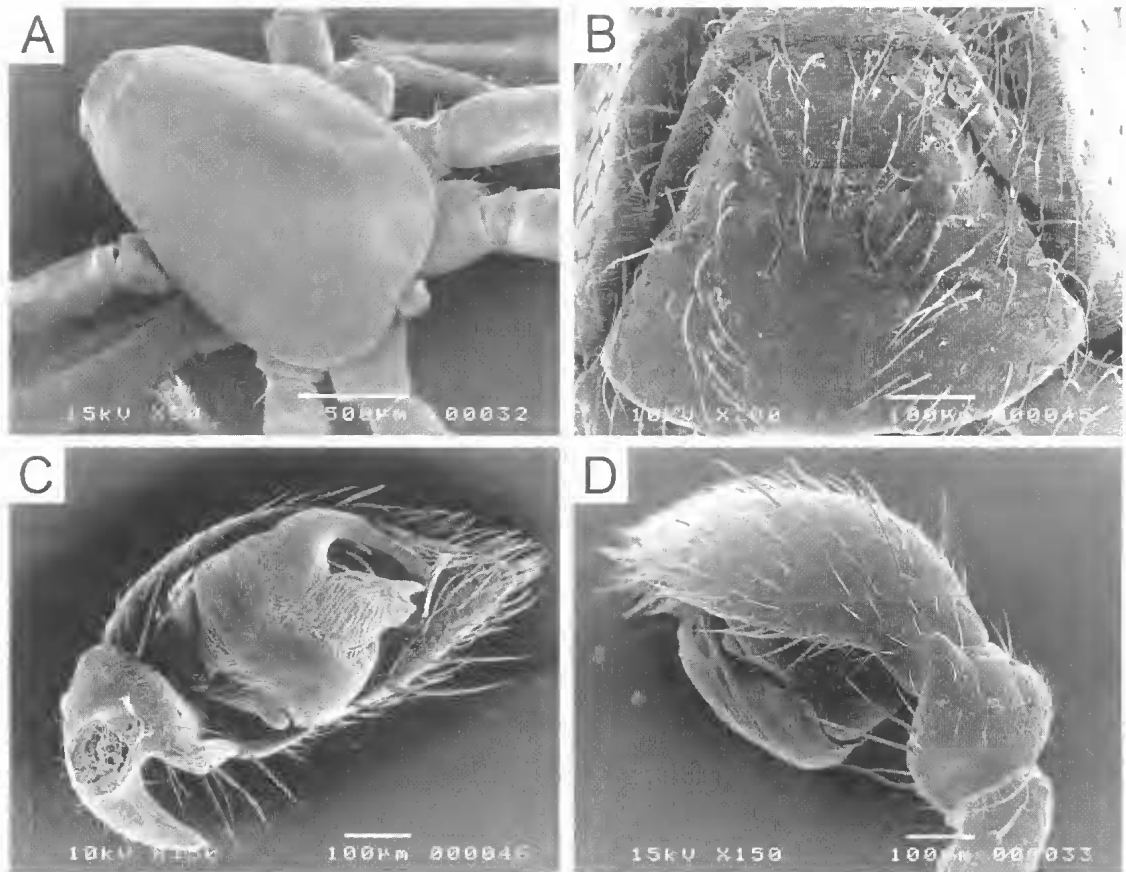


FIG. 2. *Pentasteron simplex*; A, cephalothorax dorsal; B, epigyne; C, D, left male palp; C, ventral; D, retrolateral.

Colour: exactly as in male.

Eyes: a: 0.10; b: 0.10; c: 0.12; d: 0.12; e: 0.04; f: 0.04; g: 0.04; h: 0.10; AL-AL: 0.20. MOQ: AW = 0.86 PW; AW = 0.71 L.

Clypeus 0.34 or 3.4 times ALE. Chilum single, 0.07 high, 0.36 wide

Spination:

	F	P	T	Mt
I	pl1d2	-	v2-2	v2-1-2
II	pl1d2	-	v2-1-2	v4 dw3
III	pl3d3r1l	pl1d1r1l	pl2d2r12v2-2-2	9disp dw5
IV	pl2d3r1l	pl1d1r1l	pl2d3r13v2-2-2	9disp dw5

Hinged hairs: TI d1, TII d1.

Epigyne (Fig. 6A,B): very simple; with hardly sclerotised plate with slightly concave posterior rim; copulatory openings in front, fairly closely set under semicircular darker shields; internal structure showing through translucent epigyne. Copulatory ducts very broad at entrance, describing more than one loop before entering small lateral spermathecae.

Variation: colour pattern and size very stable: ♂ carapace length 1.82-1.87 and width 1.20-1.22; ♀ carapace length 1.92-1.98, width 1.33-1.40.

DISTRIBUTION. Known only from type locality.

***Pentasteron parasimplex* sp. nov.**
(Figs 3A,B, 15)

ETYMOLOGY. Similar to *P. simplex*.

MATERIAL. HOLOTYPE: ♂, Wyperfield NP, Victoria, Dattuek track, *Eucalyptus foecunda* leaf litter, 2.vii.1982, M. Harvey & B. Roberts (WAM).

DIAGNOSIS. Coloration very uniform; ♂ ♂ with swollen ventrolateral tibial apophysis and very short LTA.

DESCRIPTION. *Male* (holotype). Total length 4.03; carapace 2.08 long, 1.40 wide; tibia+patella 1.85.

Colour: Carapace, chelicerae and sternum pale brown, patternless; legs uniform yellowish brown; abdomen dark sepia: dorsum with narrow brownish frontal scutum and five pale spots, 2 pairs and single one in front of spinnerets; venter pale sepia.

Carapace and sternum smooth.

Eyes: a: 0.14; b: 0.10; c: 0.12; d: 0.12; e: 0.02; f: 0.04; g: 0.06; h: 0.10; AL-AL: 0.26. MOQ: AW = 1.00 PW; AW = 0.75 L.

Spination:

	F	P	T	Mt
I	pl1d2	-	v2-1-2	v2
II	pl1d2	-	v1-2-1	v4
III	pl3d3r1l	pl1d1r1l	pl2d2r12v2-2-2	7disp dw6
IV	pl2d4r1l	pl1d1r1l	pl3d3r13v2-2-2	9disp dw6

Hinged hairs: TI d1, TII d1.

Abdomen with 2 dorsal sigilla and a lateral in front on either side.

Male palp (Fig. 3A,B): tibia with deep retrolateral concavity; ventrolateral apophysis swollen, rounded at the back, blunt in front; dorsolateral one fairly short and thick, sharp, pointing outwards; cymbium with fairly long flat flange, with small proximal indentation; embolus short, rigid, curved outwards; without EA; VTA short, rigid, blunt; DTA membranous; LTA very short with thick base and sharp tip.

Female unknown.

DISTRIBUTION. Known only from type locality.

***Pentasteron intermedium* sp. nov.**
(Figs 3F-H, 6E,F, 15)

ETYMOLOGY. Refers to its intermediate taxonomic position.

MATERIAL. HOLOTYPE: ♂, Augusta, Cave Break road, Western Australia, 34°20'S 115°09'E, *Agonis* & moss litter, 24.vii.1980, S. & J. Peck (WAM 90/170-1). PARATYPES: 1 subadult ♂, together with holotype; South Australia: 1 ♂, Blinman, 8-19.xii.1986, post office, on floor, 31°05'S, 138°40'E; M. Dykshoorn (SAMA); 1 ♂, Kolay Hut, 32°33'S 135°36'E, 10.xii.1989, on ground, D. Hirst (SAMA N1992120); New South Wales: 1 ♂, Federal Highway on NSW/ACT border; 35°12'S 149°12'E, 10.v.1992, J. Hunt (AM KS49459); Victoria: 2 ♀ 2 ♂, Barr Ck, Kervins Rd, Cohuna, 35°48'30"S 144°10'30"E, 1 May 1999, watering, J. Hooper, D. & J. Shield, J. Woodman (S30490); 1 ♀, Upper Lurg, 36°35'S, 146°11'E, col. J. Strudwick 14, Jan 1997 (JSt 529); 1 ♂, same data as previous (JSt 550); 1 ♀, same data as previous, 4 Apr 2000 (JSt 717); 1 ♀ 1 ♂, Spring Gully, 36°37'48"S, 144°15'17"E, J. Shield, 22-30 Dec 1993 (CVIC 777); 1 ♀, same data as previous, 18 Jan 1994 (CVIC 790); 2 ♀ 2 ♂, Barr Creek, Cohuna, 35°48.5'S, 144°10.5'E col. J. Hooper, D & J Shield, J. Woodman 1 May 1999, watering (CVIC 785).

DIAGNOSIS. Males have a unique combination of sclerites in the palp: large VTA, small spine-like LTA and large curved EA accompanying embolus along its dorsal side. Female has a simple epigyne with clearly delimited inverted v-shaped ridge in front, pale zone on posterior half.

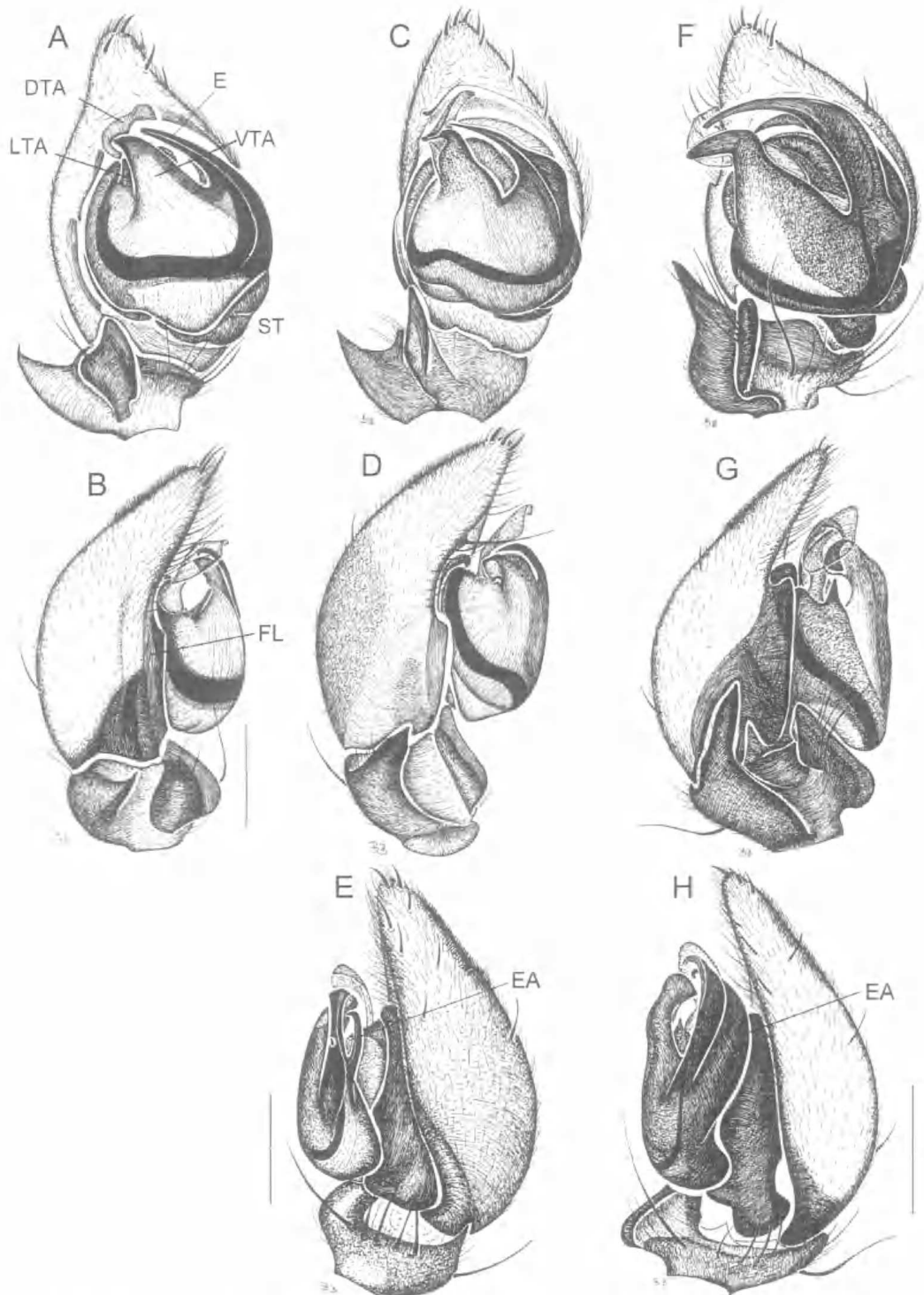


FIG. 3. *Pentasteron* spp. right male palps. A,B, *P. parasimlex*; A, ventral; B, retrolateral; C-E, *P. simplex*; C, ventral; D, retrolateral; E, prolateral; F-H, *P. intermedium*; F, ventral; G, retrolateral; H, prolateral. Scale 0.5mm. DTA = dorsal tegular apophysis, E = embolus, EA = embolar apophysis, LTA = lateral tegular apophysis, ST = subtegulum, VTA = ventral tegular apophysis.

DESCRIPTION. *Male* (holotype). Total length 3.42; carapace 1.72 long, 1.18 wide; tibia+patella I 1.50.

Colour: Carapace medium brown with faint radiating striae and V-shaped dark mark in front of fovea. Chelicerae and sternum medium brown, slightly suffused with black. Coxae pale, trochanters pale brownish yellow suffused with black on sides; femora dark brown with paler dorsal lines, in distal third, pale in proximal part; patellae, tibiae and metatarsi orange brown, tibiae with slightly darkened sides. Abdomen dark sepia to black; dorsum with 4 pale spots in frontal half and 3 pale chevrons, posterior 2 anatomising, in front of spinnerets; sides with oblique pale stripes, venter pale sepia with broad pale median stripe and a spot on either side in front of dark ring around spinnerets.

Carapace very finely reticulated; sternum smooth.

Eyes: a: 0.09; b: 0.10; c: 0.10; d: 0.10; e: 0.02; f: 0.02; g: 0.04; h: 0.08; AL-AL: 0.18. MOQ: AW = 0.83 PW; AW = 0.62 L.

Clypeus: 0.3 or 3.0 times diameter of ALE.

Spination:

	F	P	T	Mt
I	pl1d2	-	v1-1	v2
II	pl1d2	-	v1-1	v2-1dw3
III	pl1d3	pl1d1r1	pl2d2r1v2-2	8isp dw6
IV	pl2d4	pl1d1r1	pl3d3r1v2-2-2	8isp dw6

One dorsal hinged hair on tibiae I and II.

Male palp (Fig. 3F-H): tibia with large retrolateral concavity delimited by fairly flat ventrolateral lamellate apophysis with dorsal swelling and roughly triangular (as seen from above) flat dorsolateral apophysis with denticle at its dorsal base. Cymbium with fairly extensive flange. Embolus fairly short and rigid, curved outward, split at base, the dorsal prong (EA) thick and well developed. VTA well developed and strong; DTA membranous, attached to tegulum dorsal of VTA; LTA a short spine-shaped excrescence between sperm-duct and VTA.

Female (paratype). Total length 4.83; carapace 2.08 long, 1.33 wide; tibia+patella I: 1.58.

Carapace medium brown with faint darker radiating striae; chelicerae and sternum medium brown; sternum pale brown; coxae pale, brownish towards base; trochanters brownish yellow suffused with black on sides; femora white with small basolateral ring in proximal half, dark brown in distal half; remainder of legs yellowish brown, tibiae suffused with dark on

sides; abdomen dark; dorsum with 2 pairs of white spots in frontal half and 3 pale chevrons in a row in front of spinnerets; sides with 2 or 3 pale stripes; venter pale sepia with pale median stripe and a spot on either side in front of dark ring around spinnerets. Lung covers yellow.

Eyes: a: 0.10; b: 0.10; c: 0.14; d: 0.12; e: 0.04; f: 0.04; g: 0.04; h: 0.08; AL-AL: 0.18. MOQ: AW = 0.80 PW; AW = 0.66 L. Clypeus 0.36.

Chilum single, 0.08 high, 0.48 wide.

Spination:

	F	P	T	Mt
I	pl1d2	-	v2-2-2	v2
II	pl1d2	-	v1-2-2	v2-2 dw3
III	pl2d3r1	pl1d1r1	pl2d2r1v2-2-2	8disp dw6

Hinged hairs: TI d1, TII d1. Preening brush on Mt II and III.

Epigyne (Fig. 6E,F): clearly delimited inverted v-shaped ridge in front, pale zone on posterior half; copulatory ducts showing trough tegument; copulatory ducts large, strongly sclerotised, directed diagonal, ending in poorly delimited, adjacent caudal spermathecae.

Variation: ♂ carapace length: 1.72-1.84, carapace width: 1.18-1.30. Colour of carapace in South Australian specimens darker; leg colour stable; abdomen without spots or with 5 tiny spots; slight variations in shape of palpal sclerites, such as curvature of VTA and EA.

DISTRIBUTION. Western and South Australia.

Pentasteron securifer sp. nov.

(Figs 5A,B, 7A,B, 15)

ETYMOLOGY. Latin: *securis*, an axe, refers to shape of the huge, H-shaped VTA.

MATERIAL. HOLOTYPE: ♂, John Forrest NP, Western Australia, (31°52'S, 116°04'E) 1967, G.H. Lowe (WAM 90/272). PARATYPES: 2 ♀, Jarrahdale Mine site, Western Australia, 32°13'S 116°04'E, 12-18.iv.1999, K.E.G. Brennan (WAM 99/2378-2379).

DIAGNOSIS. ♂♂ have a very typical palp with very large, H-shaped VTA of which retrolateral distal part is axe-shaped; ♀♀ have an epigyne with fairly deep, roughly diamond-shaped central depression, clearly delimited in front.

DESCRIPTION. *Male* (holotype). Total length 4.79; carapace 2.40 long, 1.63 wide; tibia+patella I 2.45.

Colour: Carapace medium brown with faint darker radiating striae and V-shaped pattern in

front of fovea; chelicerae medium brown, paler along median margin; sternum pale brown, slightly darker along margin; coxae pale yellow; trochanters pale brown; femora pale in proximal half, brown in distal half; tibiae I pale yellow; II, III and IV slightly darker slightly suffused with dark on sides; metatarsi and tarsi brownish yellow; abdomen sepia; dorsum with narrow brownish frontal scutum and six pale spots, 1 pair in front, one in the middle, and two in line in front of spinnerets; sides with large oblique pale area; venter pale, darker in front of epigastric furrow.

Carapace and sternum smooth.

Eyes: a: 0.12; b: 0.12; c: 0.14; d: 0.14; e: 0.02; f: 0.04; g: 0.06; h: 0.12; AL-AL: 0.28. MOQ. AW = 0.94 PW; AW = 0.83 L.

Spination:

	I	P	T	Mt
I	p1d2	-	v2-2	v1-1 2-2
II	p1d2	-	v1-1	v1-1-2-2
III	pl3d3r3	pl7r1	pl2d2r2v2 2 2	8disp dw6
IV	pl2d4r1	pl1d1r1	pl3d2r3v2-2-2	10isp dw6

Hinged hairs: T1 d1, TII d1.

Male palp (Fig. 5A,B): tibia with deep retrolateral concavity, delimited by 2 large apophyses: ventrolateral apophysis flat, rebordered along margin, dorsolateral one roughly quadrangular with anterior corner drawn out into short sharp prong; cymbium with flat flange provided with backward directed prong, and with poorly defined distal haired ridge thus forming concavity; embolus long and slender, originating on posterior end of tegulum which has huge, roughly H-shaped VTA; its retrolateral distal prong is broad, axe-shaped and runs subparallel with membranous DTA; retrolateral part broadly connected with prolateral part which accompanies the embolus on its ventral side; LTA tiny spine; without EA.

Female (paratype). Total length 4.36; carapace 2.40 long, 1.62 wide; tibia+patella I: 2.06.

Carapace dark brown with faint darker radiating striae; chelicerae and sternum medium brown; sternum pale brown; coxae pale, yellowish towards base; trochanters dark with pale yellow ventral patch; femora white with small basolateral spots in proximal half, dark brown in distal half; remainder of legs yellowish brown, tibiae suffused with dark on sides; abdomen dark: dorsum with 6 white spots, 1 pair in front, 1 in the middle, and 2 in a row in front of spinnerets; sides with large oblique spot; venter fairly pale, paler centrally; lung covers yellow.

Eyes: a: 0.10; b: 0.10; c: 0.11; d: 0.12; e: 0.03; f: 0.03; g: 0.05; h: 0.08; AL-AL: 0.19. MOQ: AW = 0.86 PW; AW = 0.76 L. Clypeus 0.32.

Chilum single, 0.06 high, 0.22 wide.

Spination

	I	P	T	Mt
I	p1d2	-	v2-2-2	v2
II	p1d2	-	v1-2-2	v2-2 dw3
III	pl3d2r2	pl1d1r1	pl2d2r2v2-2-2	8disp dw3

Hinged hairs: T1 d1, TII d1. Preening brush on Mt II and III.

Epigyne (Fig. 7A,B): with fairly deep, roughly diamond-shaped central depression, deeper in front, there delimited by posteriorly indented plate; copulatory ducts clearly showing trough tegument; copulatory ducts large, strongly sclerotised, ending in poorly delimited, adjacent, caudal spermathecae.

DISTRIBUTION. Known only from type locality.

Pentasteron oscitans sp. nov.
(Figs 4A-C, 6C,D, 15)

ETYMOLOGY. Latin *oscitare*, accommodating; refers to the shape of the male palpal cymbium.

MATERIAL. HOLOTYPE: ♂, Barrington Tops State Forest, 1.4 km S along Bungaree trail from Barrington Tops Forest Rd, NSW, 31°56'S 151°21'E, 4.ii-9.iv.1993, 1180m (NPWS survey), M. Gray & G. Cassis (AM KS039485). PARATYPE: 1♀, together with holotype.

DIAGNOSIS. ♂♂ have a very large cymbial fold; ♀♀ differ in the shape of the posterior indentation of the epigyne.

DESCRIPTION. *Male* (holotype). Length 3.56; carapace 1.85 long, 1.22 wide; tibia+patella I 1.59.

Colour: Carapace chestnut brown; chelicerae medium brown; sternum medium brown with yellow posterior tip; coxae white with dark brown rim; trochanters dark with yellow ventral patch; femora white in proximal half, dark brown in distal half; patellae yellow with darker distal section; tibiae with white proximal part preceded by thin dark ring and dark distal part; metatarsi and tarsi yellowish brown. Abdomen shiny black; dorsum with two pairs of small white spots, sides with one oblique white spot; venter sepia, slightly paler in front of epigastric fold.

Carapace finely granulated; sternum smooth.

Eyes: a: 0.10; b: 0.10; c: 0.11; d: 0.12; e: 0.02; f: 0.02; g: 0.04; h: 0.08; AL-AL: 0.18. MOQ: AW =

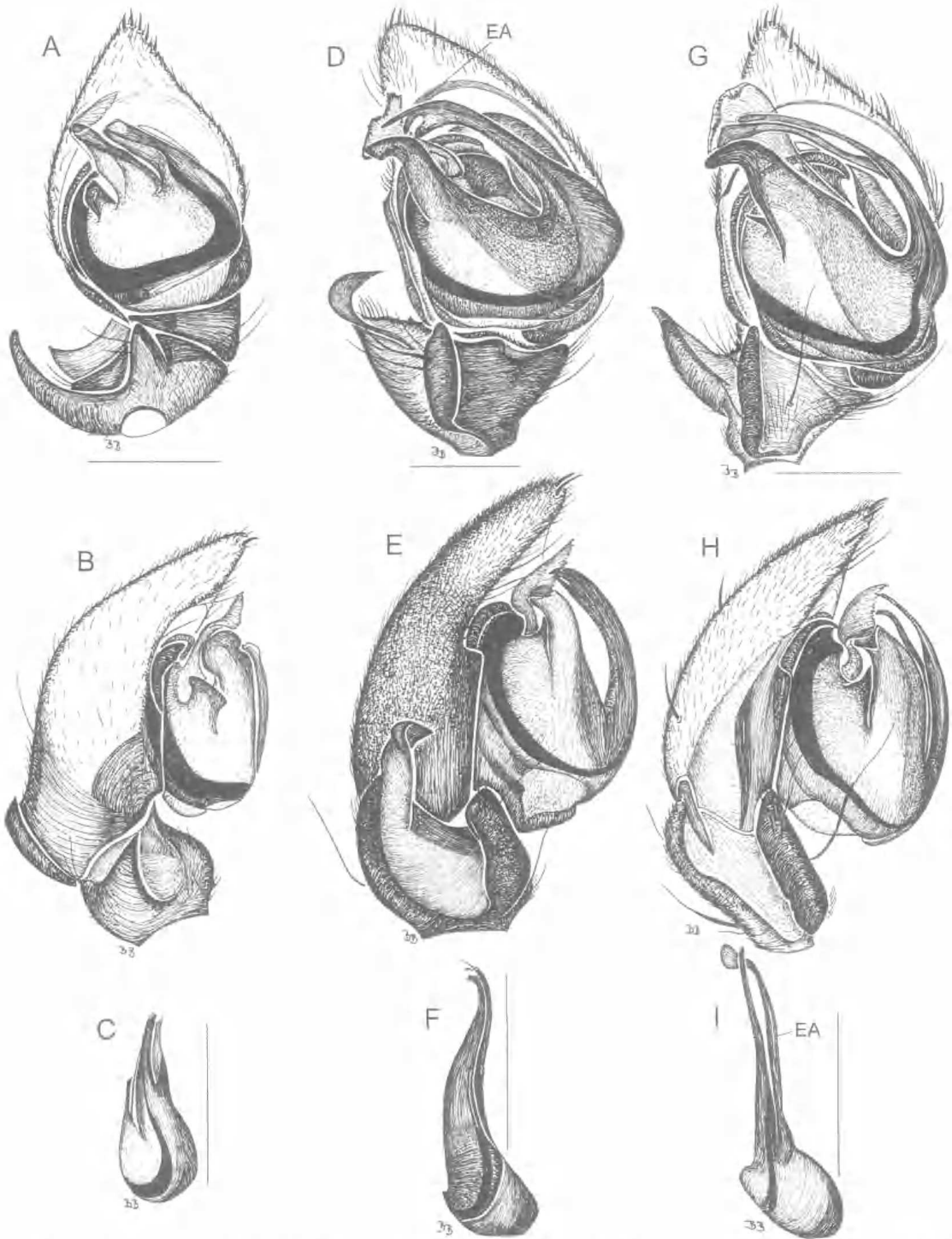


FIG. 4. *Pentasteron* spp. right male palps. A-C, *P. oscitans*: A, ventral; B, retrolateral, C, embolus with embolar apophysis, prolateral. D-F, *P. storosoides*: D, ventral; E, retrolateral; F, embolus with embolar apophysis, prolateral. G-I, *P. sordidum*: G, ventral; H, retrolateral; I, embolus with embolar apophysis, prolateral. Scale 0.5mm.

0.84 PW; AW = 0.78 L. Clypeus 0.30. Chilum 0.03 high, 0.13 wide.

Spination:

	F	P	T	Mt
I	d2	-	v2	v2
II	d2	-	v2	v2
III	pl3d3rl3	pl1d1rl1	pl2d2rl2v1-2-2	8disp dw5
IV	pl3d3rl2	pl1d1rl1	pl2d3rl2v1-2-2	10disp dw5

Hinged hairs: TI and TII: d1. Preening brush on Mt II and III.

Abdomen with large rounded lip in front of tracheal spiracle. Colulus with 3 setae.

Male palp (Fig. 4A-C): tibia with large retrolateral concavity delimited by elongate, roughly triangular, pointed dorsal apophysis and ventrolateral lamellate apophysis. Cymbium with large proximal fold, forming concavity together with tibial concavity, dorsally delimited by large triangular flap; cymbial flange unmodified. Tegulum broad based, tapered toward rounded VTA; LTA short, truncated, broader at extremity than at base; DTA membranous, distally sharply curved outwards. Embolus short, thick, rigid, curved outward; with thin short EA.

Female (paratype). Total length 4.31; carapace 1.98 long, 1.35 wide; tibia+patella I: 1.58.

Colour: As ♂ but sternum uniform medium brown. Palp: femora dark brown with pale ventral patch, other segments yellow.

Eyes: a: 0.10; b: 0.10; c: 0.11; d: 0.12; e: 0.03; f: 0.03; g: 0.05; h: 0.08; AL-AL: 0.19. MOQ: AW = 0.86 PW; AW = 0.76 L. Clypeus 0.32.

Chilum single, 0.06 high, 0.22 wide.

Spination:

	F	P	T	Mt
I	d1	-	v2-2-2	v2
II	d1	-	v2-1-2	v2
III	pl2d3rl1	pl1d1rl1	pl2d2rl2v2-2-2	8disp dw5
IV	pl2d3	pl1d1rl1	pl2d2rl2v2-2-2	10disp dw5

Hinged hairs: TI d1, TII d1. Preening brush on Mt II and III.

Epigyne (Fig. 6C,D): simple, sclerotised plate with 2 depressions (entrance openings) centrally; posterior clearly indented. Copulatory ducts and spermathecae strongly sclerotised.

DISTRIBUTION. Known only from type locality.

***Pentasteron sordidum* sp. nov.**
(Figs 4G-I, 15)

ETYMOLOGY. The name refers to the colour of the male which is rather 'dirty' (Latin: *sordidus*).

MATERIAL. HOLOTYPE: ♂, Lake Wytchugga, 6km w. Wilcannia, New South Wales, 21-22.xii.1998, M. Baehr (QM S46889).

DIAGNOSIS. ♂♂ have a palp with deep tibial concavity delimited by the large longitudinal swollen ventrolateral swelling and a ventrally ridged dorsolateral apophysis.

DESCRIPTION. *Male* (holotype). Total length 4.88; carapace 2.38 long, 1.56 wide; tibia+patella I 1.74.

Colour: Carapace chestnut brown; chelicerae and sternum medium brown; coxae pale; trochanters yellowish brown; femora I yellowish brown with darker patches at base and tip; femora II-IV white in proximal half, yellow overlaid with dark brown in distal half; other parts yellow. Abdomen grey mottled with white and black, yellowish in front of epigastric fold and on lip in front of tracheal spiracle.

Carapace finely granulated; sternum smooth.

Eyes: a: 0.15; b: 0.14; c: 0.14; d: 0.14; e: 0.03; f: 0.02; g: 0.04; h: 0.10; AL-AL: 0.26. MOQ: AW = 1.03 PW; AW = 0.87 L. Clypeus 0.42 or 3.0 times ALE. Chilum 0.08 high, 0.30 wide.

Spination:

	F	P	T	Mt
I	pl1d2	-	v2-2-2	v1-1-1-1
II	d2	-	v2-2-2	v1-1-1-1dw3
III	pl3d3rl2	pl1d1rl1	pl2d2rl2v2-2-2	8disp dw5
IV	pl2d3rl1	pl1d1rl1	pl3d3rl3v2-2-2	lost

Hinged hairs: TI and TII: d1. Preening brush on Mt II and III.

Abdomen with large rounded lip in front of tracheal spiracle. Colulus a group of c. 10 setae.

Male palp (Fig. 4G-I): tibia with large retrolateral concavity delimited by thick longitudinal ventrolateral swelling and large dorsolateral, ventrally ridged apophysis; cymbium with basal fold linked up with tibial concavity. Tegulum broad at base, tapered toward strong VTA which has tip curved outward; LTA short, thorn-shaped; DTA membranous, widened toward broadly truncate extremity. Embolus fairly short, curved outward, thin but rigid; with EA longer than embolus proper, slightly widened at tip.

Female unknown.

DISTRIBUTION. Known only from type locality.

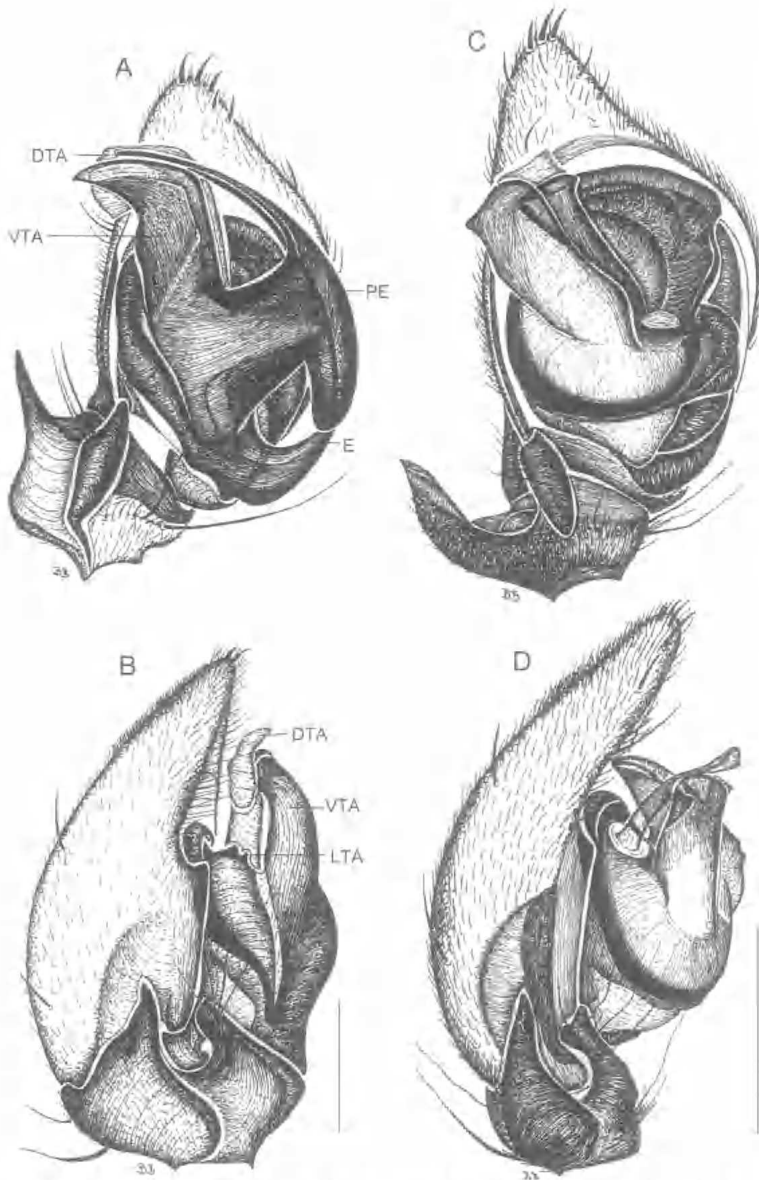


FIG. 5. *Pentasteron* spp. right male palps. A,B, *P. securifer*; A, ventral; B, retrolateral. C,D, *P. isobelae*; C, ventral; D, retrolateral. Scale 0.5mm. DTA = dorsal tegular apophysis, E = embolus, LTA = lateral tegular apophysis. VTA = ventral tegular apophysis.

DIAGNOSIS. Males have a palp with a deep tibial concavity delimited by the large longitudinal ventrolateral swelling and a dorsolateral apophysis with recurved tip, in combination with the bifid embolar apophysis which gives the impression that the embolar complex is trifid.

DESCRIPTION. *Male* (holotype). Total length 4.88; carapace 2.46 long, 1.74 wide; tibia+patella 1.250.

Colour: Carapace chestnut brown; chelicerae and sternum medium brown; coxae white with dark brown rim; trochanters dark with yellow ventral patch; femora white with dark patches at base in proximal half, dark brown in distal half; remainder of legs yellowish brown, posterior tibiae with blackish lateral streaks. Abdomen shiny black; dorsum with two pairs of small white spots and 3 crescent-shaped spots in front of spinnerets; sides with one oblique white spot and pale mottling; venter sepia, with two yellow spots in front of epigastric fold. Carapace finely granulated; sternum smooth.

Eyes: a: 0.15; b: 0.12; c: 0.14; d: 0.14; e: 0.04; f: 0.02; g: 0.07; h: 0.14; AL-AL: 0.28. MOQ: AW = 1.00 PW; AW = 0.86 L. Clypeus 0.48 or 4 times ALE. Chilum 0.10 high, 0.036 wide.

Spination:

	F	P	T	Mt
I	pp1d2	-	v2-2-2	v2-1-1
II	pl1d3	-	v1-2-2	v2-2dw3
III	pl2d2r2	pl1d1r1	pl2d2r2v2-2-2	10disp dw6
IV	pl2d5	pl1d1r1	pl3d3r3v2-2-2	10disp dw6

***Pentasteron storosoides* sp. nov.**
(Figs 4D-F, 15)

ETYMOLOGY. Superficially like *Storosa* Jocqué in its deep tibial concavity and strong ventral tibial knob.

MATERIAL. HOLOTYPE: ♂, 30km SW of Wilcannia, New South Wales, ca. 142°45'E, ca. 32°25'S, 22.xii.1998, black box fogging. U. & M. Baehr (QM S46948).

Hinged hairs: TI and TII: d1. Preening brush on Mt II and III.

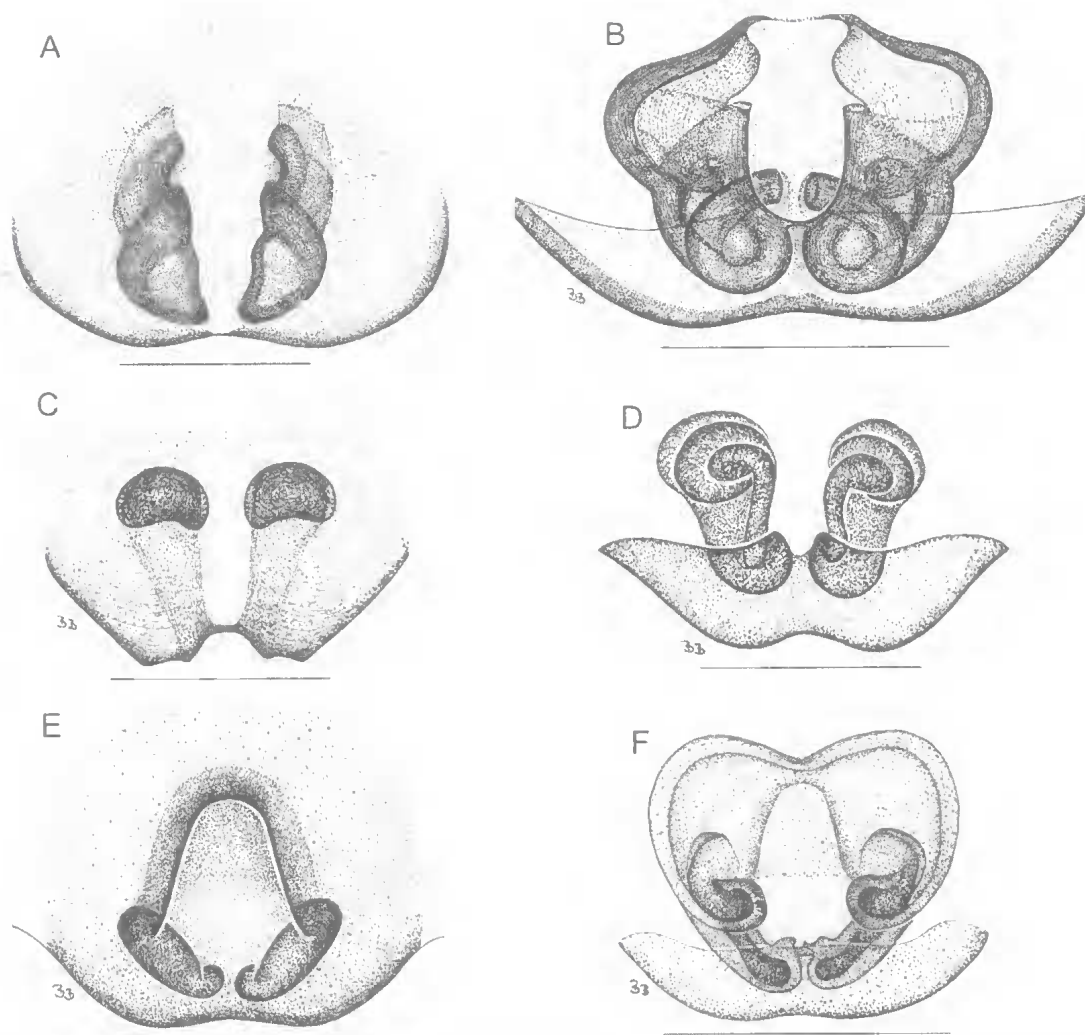


FIG. 6. *Pentasteron* spp. epigynes. A,B, *P. simplex*; A, ventral; B, dorsal (cleared). C,D, *P. oscitans*; C, ventral; D, dorsal. E,F, *P. intermedium* E, ventral; F, dorsal. Scale 0.5 mm.

Abdomen: anterior lip of tracheal spiracle not contrasting from rest of venter; posterior lip larger, sticking out, brownish yellow. Colulus a small swelling with 8 setae.

Male palp (Fig. 4D-F): tibia with large retrolateral concavity delimited by thick longitudinal ventrolateral swelling and large dorsolateral apophysis with strongly recurved tip; with short prolateral dorsal apophysis. Cymbium with shallow proximal fold and shallow basal concavity. Cymbial flange long, separated in front from cymbial rim by short bend. Tegulum broad at base, tapered toward fairly slender VTA; LTA short, thorn-shaped; DTA membranous, widened towards truncated,

serrated extremity. Embolus fairly short, fairly slender; EA with bifid tip, giving the embolar complex a trifold impression.

DISTRIBUTION. Known only from type locality.

***Pentasteron isobelae* sp. nov.**
(Figs 5C,D, 7C,D, 15)

ETYMOLOGY. In honour of Isobel Raven.

MATERIAL. HOLOTYPE: ♂, Ramornie SF, Track off Mt Tindal Rd. NSW, 29°42'S 152°38'E, 4.ii-9.iv.1993, 220m, M. Gray & G. Cassis (AM 039404). PARATYPES: New South Wales: 1 ♀, together with holotype; 1 ♀, NSW, 68AR, Maria River SF, NPWS survey, 1km along Northern Trail into rubbish dump, 31°08'S 152°28'E, 4.ii-9.iv.1993, 35m, M. Gray & G. Cassis (AMKS 039403);

1♂, Ramornie SF, Track off Mt Tindal Rd, 29°42'S 152°37'E, 4.ii-9.iv.1993, 220m, M. Gray & G. Cassis (NPWS survey) (AM KS039402); 1♂, Tindal Rd, 380m, further as previous (AM KS 039200); 1♂, 240 m east of junction of Kunderang East and Kunderang West Rds, 30°48S 152°02'E, 4.ii-9.iv.1993, 900m, M. Gray & G. Cassis (NPWS survey) (AM KS039120); 1♂, Bundjalung National 20, near gravel quarry, 29°17'S 153°16'E, 4.ii-9.iv.1993, M. Gray & G. Cassis (AM KS 039198); 1♂, Chaelundi SF, 1.2km W along Stockyard Fire Trail from Chandlers Ck, 29°56S 152°31E, 450m, 4.ii-9.iv.1993, M. Gray & G. Cassis (AM KS 039199); SE Queensland: 2♂, Expedition Ra NP, Amphitheatre camp, 25°12'S 148°59'E, 14-19.xii.1998, 560m, open forest, G. Montheith, G. Cook & G. Thompson (QM S52611).

DIAGNOSIS. Male palp with a small cymbial concavity and ear-shaped embolar appendage; ♀♀ with large central depressions and an almost straight posterior margin of epigyne.

DESCRIPTION. *Male* (holotype; Pt in brackets), length 4.74 (4.46); carapace 2.30 (2.16) long, 1.62 (1.60) wide; tibia+patella I 2.22 (2.11).

Colour: Carapace chestnut brown; chelicerae medium brown; sternum medium brownish with darker lateral margins; coxae white; trochanters dark with yellow ventral spot; femora white in proximal half, dark brown in distal half; patellae yellow; tibiae yellow suffused with black on sides; metatarsi and tarsi yellow. Abdomen dark grey; dorsum with 2 pairs of small white spots followed by 2 white chevrons and spot with sinuous margins in front of spinnerets; sides with 1 white spot in front and 3 large oblique stripes; venter sepia with 2 small yellow spots in front of epigastric fold; lung covers yellow.

Carapace finely granulated; sternum smooth.

Eyes: a: 0.16; b: 0.12; c: 0.11; d: 0.12; e: 0.03; f: 0.03; g: 0.08; h: 0.10; AL-AL: 0.32. MOQ: AW = 1.06 PW; AW = 1.00 L. Clypeus 0.38 or 3.2 times ALE.

Chilum single 0.24 wide 0.08 high.

Spination:

	F	P	T	Mt
I	p11d2	-	v2-2-2	2-2-2
II	d2	-	v2-2-2	v2-2 dw3
III	p12d3r1	p11d1r1	p12d2r13v2-2-2	10disp dw5
IV	p11d4	p11d1r1	p13d3r13v2-2-2	10disp dw5

Hinged hairs: TII and TIII: d1. Preening brush on Mt II and III.

Male palp (Fig. 5C,D): femur and patella pale, contrasting with remainder of palp; tibia with large retrolateral concavity delimited along posterior end by solid, tapered and twisted, sharp-

tipped apophysis pointing forward and thin, truncated and slightly indented ventrolateral apophysis. Cymbium with shallow basal concavity according with tibial concavity; flange unmodified. Tegulum broad, with large, tongue-shaped terminal VTA. Embolus short, flat, rigid, slightly twisted, almost straight, accompanied by large, flat transparent ear-shaped apophysis, provided with 2 semicircular ridges; DTA membranous, narrow, straight.

Female (paratype). Total length 5.60; carapace 2.56 long, 1.70 wide; tibia+patella I: 2.53.

Colour: almost as in male but generally paler.

Eyes: a: 0.16; b: 0.15; c: 0.14; d: 0.15; e: 0.05; f: 0.03; g: 0.08; h: 0.15; AL-AL: 0.32. MOQ: AW = 1.00 PW; AW = 0.85 L.

Clypeus: 0.44 or 3.0 times ALE. Chilum single 0.23 wide, 0.11 high.

Legs: Spination:

	F	P	T	Mt
I	p11d2	-	v2-2-2	v2-1-1-2
II	d2	-	p12v2-2-2	v2-1-2 dw3
III	p12d3r1	p11d1r1	p12d2r12v2-2-2	10disp dw5
IV	p11d3r1	p11d1r1	p13d3r13v2-2-2	10disp dw5

Hinged hairs: T1 d1, TII d1. Preening brush on Mt II and III.

Epigyne (Fig. 7C,D): simple: suboval sclerotised with almost straight posterior rim and 2 large central depressions. Copulatory ducts semicircular; spermathecae small, caudal, adjacent.

Variation: colour pattern and size very stable: ♂ carapace length 1.82-1.87, width 1.20-1.22; ♀ carapace 1.92-1.98 long, 1.33-1.40 wide.

DISTRIBUTION. SE Queensland and NSW.

Phenasteron gen. nov.

TYPE SPECIES. *Phenasteron longiconductor* sp. nov.

ETYMOLOGY. Greek *phenomenon* with *Asteron*; refers to 'phenomenal' male palps. Gender is neuter.

DIAGNOSIS. ♂♂ have an domed cephalothorax with highest point just in front of fovea (Fig. 9A), enormous T-shaped distal tegular apophysis (DTA) with refolded margin (Fig. 9B,D), course of the sperm-duct in the tegulum not transverse but oblique and the posterior sclerotised swelling of the subtegulum. ♀♀ unknown.

DESCRIPTION. Small spiders (2.90-3.5) with smooth or slightly granulate tegument. Carapace widest at level of coxae II (Fig. 8), narrowed to

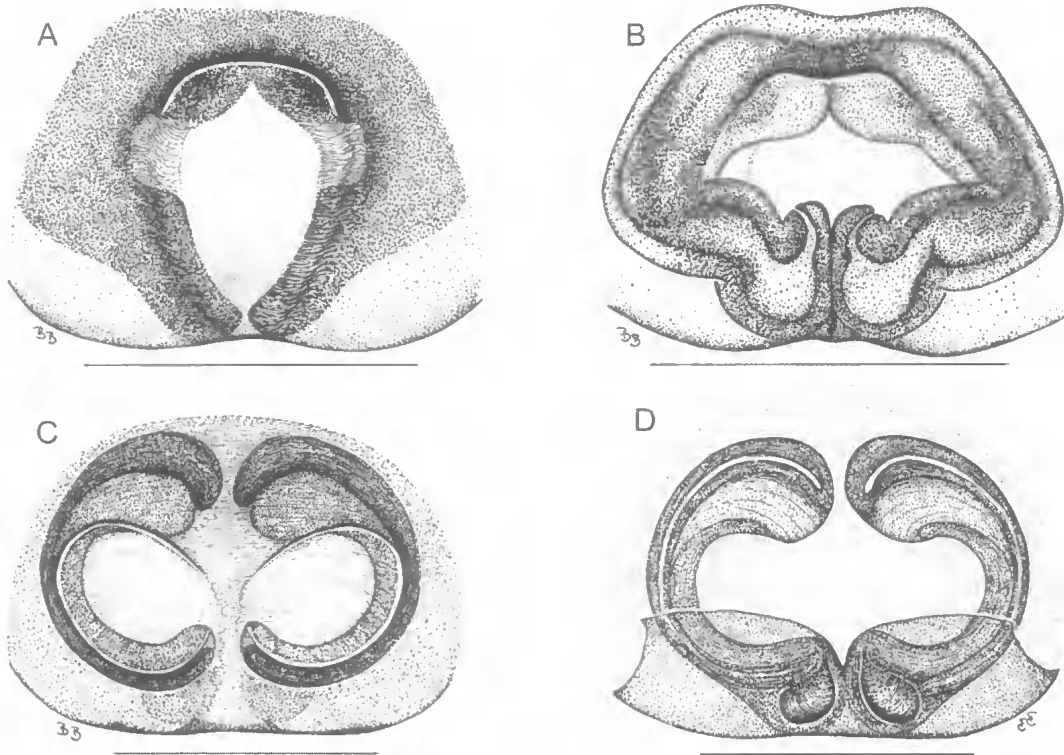


FIG. 7. *Pentasteron* spp. epigynes. A,B, *P. securifer*; A, ventral; B, dorsal (cleared). C,D, *P. isobelae*; C, ventral; D, dorsal. Scale 0.5mm.

0.60 maximum width in males. Profile domed with highest point just in front of fovea (Fig. 9A).

Colour: carapace orange to medium brown, chelicerae and sternum yellowish brown.

Eyes (Figs 8, 9A) in 3 rows (2-4-2). Only ALE in first row, second AME (in middle) and PLE, third only of PME. Eyes subequal or AME larger than remainder. MOQ slightly longer than wide. Clypeus slightly concave retreating, c. 5 times diameter of ALE; with few hairs. Chilum single, short and wide, without setae. Chelicerae as usual in the family with few hairs in front and dense row on distal promargin; no teeth. Labium narrowed at base; sparsely haired. Gnathocoxae rather elongate; sparsely haired; with anteromesal scopula. Sternum flat; triangular with slightly procurved anterior margin and slight triangular extensions between coxae. No inter- nor precoxal sclerites. Abdomen dark sepia with five pale spots.

Legs: formula 4123. Spination: few spines on pairs I, II, more numerous on III, IV. Paired tarsal claws with numerous (12-14) teeth. Unpaired claw on small onychium.

Trichobothria in 2 rows on T, single row on Mt and t. Hinged hairs few, restricted to dorsal side of T1 and II. Metatarsal preening brush on Mt II and III poorly developed.

Abdomen oval; with poorly developed translucent anterior scutum; with faint dorsal sigilla and small lateral frontal sigillum on sides. Spinnerets: AS, conical, with short distal segment; MS, PS small, in a row. Colulus represented only by some hairs. Tracheal spiracle ordinary, small.

Male palp (Fig. 9B-E): tibia with large retro-lateral concavity delimited by solid dorsolateral apophysis and ventrolateral apophysis, with swollen lateral margin provided with macrosetae or row of hairs. Cymbium unmodified, flange simple, area above it sclerotised and slightly concave. Subtegulum with backward extended swelling. Base of tegulum narrowed toward origin of embolus; course of seminal duct oblique, not transverse; VTA large; DTA very large, T-shaped, distal margin of transverse bar refolded. Embolus emerging on lateral part of tegulum, long and slender. LTA a small, short thorn, or reduced.

Females unknown.

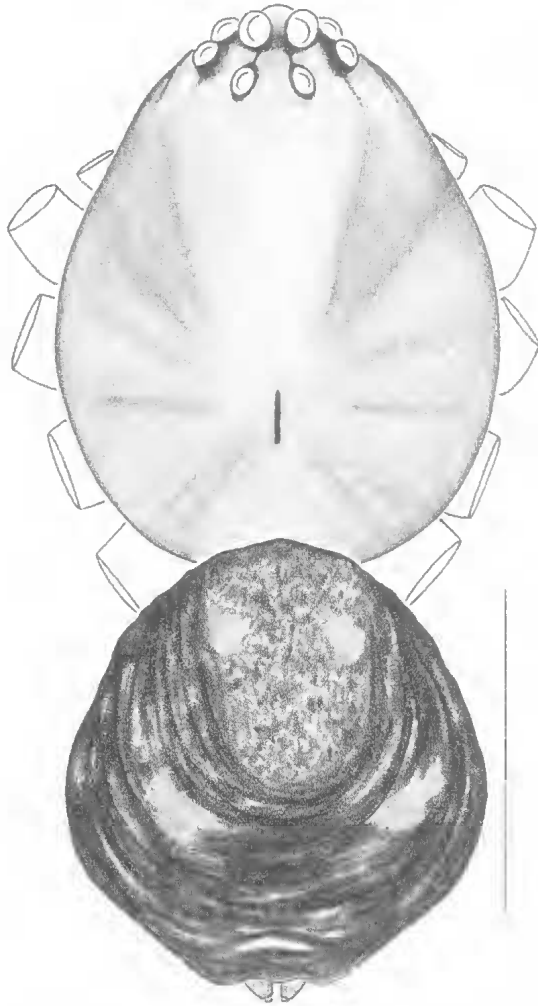


FIG. 8. *Phenasteron longiconductor* body dorsal. Scale 1mm.

KEY TO THE SPECIES OF *PHENASTERON*

- 1. DTA and embolus almost as long as bulb; VTA with long slender distal prong, at right angle with body of this apophysis; course of sperm-duct longitudinal (Fig.9B,C) *P. longiconductor*
- DTA and embolus much shorter than bulb; VTA without slender distal part, course of sperm-duct oblique (Fig.9D,E) *P. machinosum*

***Phenasteron longiconductor* sp. nov.**
(Figs 8, 9A-C, 16)

ETYMOLOGY. Noun in apposition, refers to the very large DTA which appears to be the functional conductor.

MATERIAL. Holotype, ♂, 12.3km SSW of Murrayville P.O. Victoria 35°22'S 141°09'E; site 62, xi.1985, drift fence pitfall trap, A.L. Yen (VM). PARATYPES: Victoria:

1 ♂, 6.5 km SW of junction of MV highway and Annuello Rd., 34°50'S 142°34'E, site 11, x.1985, drift fence pitfall trap, A.L. Yen (VM); 1 ♂, 16 km SE of Murrayville, 35°22'S 141°19'E, site 71, xi.1985, drift fence pitfall trap, A.L. Yen (VM); 1 ♂, 15.5 km WSW of Hattah, 34°47'S 142°07'E, site 40, x.1985, drift fence pitfall trap, A.L. Yen (VM); WA: 1 ♂, Nanga station, 26°35'31"S 113°53'22"E 16.x.1994-19.i.1995 (WAM 99/2379), N. McKenzie & J. Rolfe, wet pits WAM/CALM Carnarvon survey (NA5).

DIAGNOSIS. Males have an enormous pick-shaped tegular apophysis at embolus base.

DESCRIPTION. *Male* (holotype). Length 3.51; carapace 1.87 long, 1.31 wide; tibia+patella 1 1.33 long.

Colour: Carapace medium brown with darker radiating striae and u-shaped darker pattern delimiting cephalic area; chelicerae and sternum medium reddish brown; coxae pale; trochanters pale with dark pro- and retrolateral spots; proximal half of femora white with dark proximal ring, distal half of femora II-IV medium brown suffused with black; femur I pale brown suffused with black; patellae uniform pale yellow; tibiae brownish yellow, darkened on ventral side. Abdomen dark sepia; dorsum with faint, narrow dark brown scutum in front and 5 white spots: 2 pairs in anterior half, and 1 spot in posterior half; 2 oblique white stripes on each side.

Carapace and sternum finely granulated. Highest point of profile halfway between fovea and PME.

Eyes: a: 0.12; b: 0.08; c: 0.08; d: 0.09; e: 0.03; f: 0.02; g: 0.10 h: 0.12; AL-AL: 0.28. MOQ: AW = 1.00 PW; AW = 0.87 L. Clypeus retreating, 0.34 or 4.2 times the diameter of an ALE.

Chilum single, 0.08 high, 0.18 wide.

Legs: Spination:

	F	P	T	Mt
I	d1	-	-	-
II	d1	-	-	dw2
III	d2	pl1d1r1	pl2d2r1v2-2	4disp dw6

One hinged hair on tibiae I and II.

Male palp (Fig. 9B,C): tibia with large retrolateral concavity delimited by 2 apophyses: ventrolateral one, lamellate with sharply bent distal tip and ventrolateral haired ridge, dorso-lateral one long, gradually tapered, sharp. Cymbium dorsoventrally flattened, ventrally glabrous; basally shallowly concave; with retrolateral haired ridge and long flange distally curved and swollen. Subtegulum extended backwards, swelling strongly sclerotised, reaching special

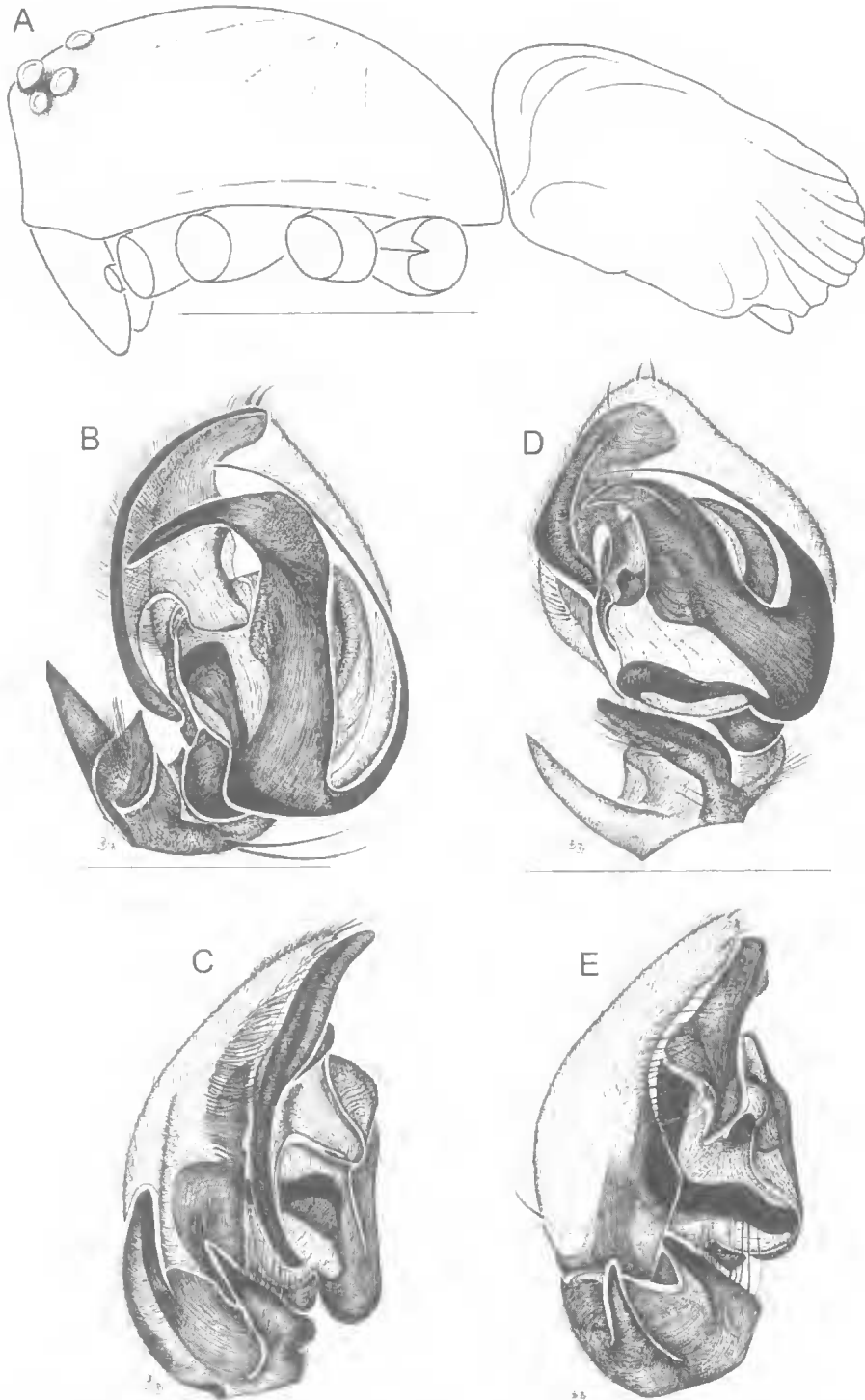


FIG. 9. *Phenasteron* spp. A-C. *P. longiconductor*; A, body lateral; B,C, right ♂ palp; B, ventral; C, retrolateral. D,E. *P. machinosum*. right ♂ palp; D, ventral; E, retrolateral. Scales, B, 1mm; D, 0.5mm.

concavity of tibia; tegulum broad at base, spermiduct slightly bent backward. Embolus about as long as cymbium, fairly slender, curved outward. VTA very large, pick-shaped; base long, broad distal part turned outwards over more than 90°, short, sturdy; DTA very large; retrolateral margin rebordered, anterior prong broad and rounded, posterior prong long, tapered toward blunt apex.

Female unknown.

Size, colour pattern and spination very stable.

DISTRIBUTION. Victoria and WA.

***Phenasteron machinosum* sp. nov.**
(Figs 9D,E, 16)

ETYMOLOGY. Latin: *machinosus*, provided with tools; refers to the tool-shaped palpal sclerites.

MATERIAL. HOLOTYPE: ♂, South Gap Station, Beda Hill, Sth Aust, 31°51'S 137°37'E; 4-6.xii.1989, pitfall trap, D. Hirst (SAMA N199296).

DIAGNOSIS. Males with large shovel-shaped tegular apophysis (VTA) at embolus base; subtegulum with backwardly extended posterior swelling.

DESCRIPTION. *Male* (holotype). Total length 2.90; carapace 1.42 long, 1.12 wide; tibia+patella 11.06 long.

Colour: Carapace orange brown with faint darker radiating striae and u-shaped darker pattern delimiting slightly paler cephalic area; chelicerae and sternum pale yellowish brown, sternum darkened along margin; coxae pale; trochanters pale with dark pro- and retrolateral spots; proximal half of femora white with dark proximal ring, distal half of femora pale yellow suffused with black on sides; tibiae I and II pale yellow and suffused with black on venter and sides in proximal half, pale in distal half; tibiae III and IV pale yellow, suffused with black on venter and sides; metatarsi yellow; tarsi orange yellow, darkened towards tip. Abdomen dark sepia; dorsum with faint, narrow dark brown suture in front and 5 white spots: 2 pairs in anterior half, and 1 spot in posterior half; 2 oblique white stripes on each side.

Carapace and sternum finely granulated. Carapace fairly high, highest point of profile just in front of fovea.

Eyes: a: 0.09; b: 0.08; c: 0.07; d: 0.06; e: 0.02; f: 0.01; g: 0.08 h: 0.10; AL-AL: 0.18. MOQ: AW = 0.18 PW; AW = 0.75 L.

Clypeus slightly retreating, 0.28 or 3.5 times ALF. Chilum single: 0.10 high, 0.28 wide.

Spination:

	I	P	II	III
I	d1		v2-1	v2
II	d1		v1	v2
III	d2	pl1d1m	pl2d1d2v1-2	5daps dw6
IV	d2	pl1d1m	pl2d2d2v1-1-2 2	7daps dw5

One dorsal hinged hair on tibiae I, II.

Male palp (Fig. 9D,E). femur pale with dark retrolateral patch, patella pale, contrasting with rest of palp; tibia with large retrolateral concavity delimited by two apophyses; ventrolateral one fairly flat with group of strong setae; dorsolateral one ridge-shaped with sharp, proximal prong, slightly curved forward. Cymbium with thin but well developed retrolateral flange in proximal half. Embolus about half as long as cymbium, fairly slender, curved outward. VTA large, in shape of curved shovel, base fairly broad but narrower than distal part ending in slightly curved, distally rebordered flat part. DTA large; retrolateral margin strongly rebordered, anterior prong broad, rounded, posterior prong fairly short, sharp, curved inward.

Female unknown.

Colour pattern and spination very stable.

DISTRIBUTION. Known only from type locality.

***Leptasteron* gen. nov.**

TYPE SPECIES. *Leptasteron platyconductor* sp. nov.

ETYMOLOGY. Greek leptos, hidden with *Asteron* refers to this genus remaining hidden in the *Asteron*-complex. Gender is neuter.

Baehr & Jocque (1996) mentioned these taxa as the *brachyconductor*-group.

DIAGNOSIS. Males have flat cephalothorax, elongate flat cymbium, large distal tegular apophysis (DTA) with refolded margin, spermiduct in the tegulum not transverse but longitudinal and posterior sclerotised swelling of the subtegulum. Females unknown.

DESCRIPTION. Small to medium-sized (4.80-6.60) with smooth or slightly granulate tegument. Carapace widest at level of coxae II, narrowed to 0.65 max. width in ♂♂. Profile flat with highest point just behind PME (Fig. 11A).

Colour: variable; carapace colour varies from dark brown (*L. platyconductor*) to bright yellow (*L. vexillum*), chelicerae and sternum and legs uniform legs (*L. vexillum*) or with contrasting leg segments (*L. platyconductor*). Abdomen dark sepia with five pale spots. Sclerotised in front of

epigastric fold (*L. platyconductor*) or with pale booklung opercula (*L. vexillum*).

Eyes (Figs 10A,B,11A) in 3 rows (2-4-2). ALE only in first row, second with AME (in middle) and PLE, the third of PME. Eyes subequal or AME larger than remainder. MOQ slightly longer than wide. Clypeus straight or slightly retreating, 2.5 to 4 times diameter of ALE; with few hairs. Chilum single (*L. vexillum*) or double (*L. platyconductor*). Chelicerae as for family with a few hairs in front and a dense row on distal promargin; no teeth. Labium narrowed at base; sparsely haired. Gnathocoxae rather elongate; sparsely haired; with anteromesal scopula. Sternum flat; triangular with straight anterior margin and slight triangular extensions between coxae. No inter- nor precoxal sclerites.

Legs: formula 4123. Spination: few spines on pairs I, II, more numerous on III, IV. Paired tarsal claws with numerous (12-14) teeth. Unpaired claw on small onychium.

Trichobothria in two rows on T, single row on Mt and T. Hinged hairs present but few, restricted to dorsal side of T1 and II. Metatarsal preening brush on Mt II and III poorly developed.

Abdomen oval; with poorly developed translucent anterior scutum; with (*L. platyconductor*) or without (*P. vexillum*) dorsal and lateral sigilla. Spinnerets: AS, conical, with very short distal segment; MS and PS small, in a row. Colulus represented only by some hairs. Tracheal spiracle hidden by well developed anterior lip.

Male palp (Fig. 11B-E): tibia with a large retro-lateral concavity delimited by a solid dorsolateral apophysis and ventrolateral apophysis, with swollen lateral margin provided with macrosetae or row of hairs. Cymbium elongate, flat, flange simple, area above it sclerotised and slightly concave. Subtegulum with backward-extended swelling. Base of narrowed tegulum toward origin of embolus; course of seminal duct longitudinal, not transverse; VTA large, either wide and with large recurved extremity or long and slender. Embolus emerging on posterior part of tegulum, very long and slender. LTA small; knob-shaped; DTA very large, membranous or sclerotised; distal margin refolded.

Females unknown.

KEY TO THE SPECIES OF *LEPTASTERON*

- Carapace uniform yellow; DTA membranous, T-shaped; VTA long and slender (Fig. 11D-E) *L. vexillum*
- Carapace uniform dark brown; DTA sclerotised, sickle-shaped, VTA not long and slender but sharply bent (Fig. 11B,C) *L. platyconductor*

Leptasteron platyconductor sp. nov. (Figs 10A,11A-C,16)

ETYMOLOGY. Noun in apposition; refers to wide flat DTA which appears to be the functional conductor.

MATERIAL. HOLOTYPE: ♂, Cape Range, WA, 22°05'S 114°00'E; 14.iii-6.v.1992, pitfall trap outside cave C56, R.D. Brooks (WAM BES:1103). PARATYPE: 1♂, Station Creek, 127 km SSE Leinster, Western Australia, 28°45'S, 121°00'E, 8-9.xi.1987, M. Baehr (QM S45244).

DIAGNOSIS. Males with elongate palpal cymbium and very broad, large DTA (Fig. 11B); uniform dark colour.

DESCRIPTION. *Male* (holotype, paratype in brackets). Total length: abdomen missing in holotype (6.60); carapace 3.11 (3.10) long, 2.04 (2.02) wide; tibia+patella 1 2.85 (2.80) long.

Colour: Carapace dark brown with darker radiating striae and v-shaped darker pattern in front of fovea; chelicerae and sternum dark brown; coxae, trochanters and femora dark brown with some darker stripes; tibiae medium brown with darker ventral side; metatarsi and tarsi brownish yellow. Abdomen dark sepia with five small white spots two in front, two in middle, one in front of spinnerets. Sides sepia, mottled with pale; venter pale sepia; two pale spots in front of epigastric fold; lung covers yellow.

Carapace and sternum smooth. Carapace fairly flat, highest point of profile just behind PME, provided with sparse but evenly dispersed cover of tiny setae.

Eyes: a: 0.16; b: 0.14; c: 0.17; d: 0.14; e: 0.04; f: 0.02; g: 0.08 h: 0.12; AL-AL: 0.30. MOQ: AW = 0.86 PW; AW = 0.82 L. Clypeus slightly retreating, 0.70 or 5.0 times diameter of ALE.

Chilum double: each part 0.12 high and 0.28 wide.

Legs: Spination:

	T	P	T	Mt
I	pl1d2	-	v2-1-2	v2-1-1-2
II	d2	-	pl1v1-1-2	v2-1-1dw2
III	pl3d2r2	pl1d1r1	pl2d2r2v2-2-2	8disp dw6
IV	pl2d3r2	pl1d1r1	pl3d2r3v2-2-2	8disp dw6

One hinged hair on tibiae I and II. Preening brush on Mt II and III.

Abdomen with 2 round dorsal sigilla and an elongate lateral one in front on either side. Tracheal spiracle with swollen anterior lip and sclerotised protruding posterior lip. Colulus a group of about 8 short setae.

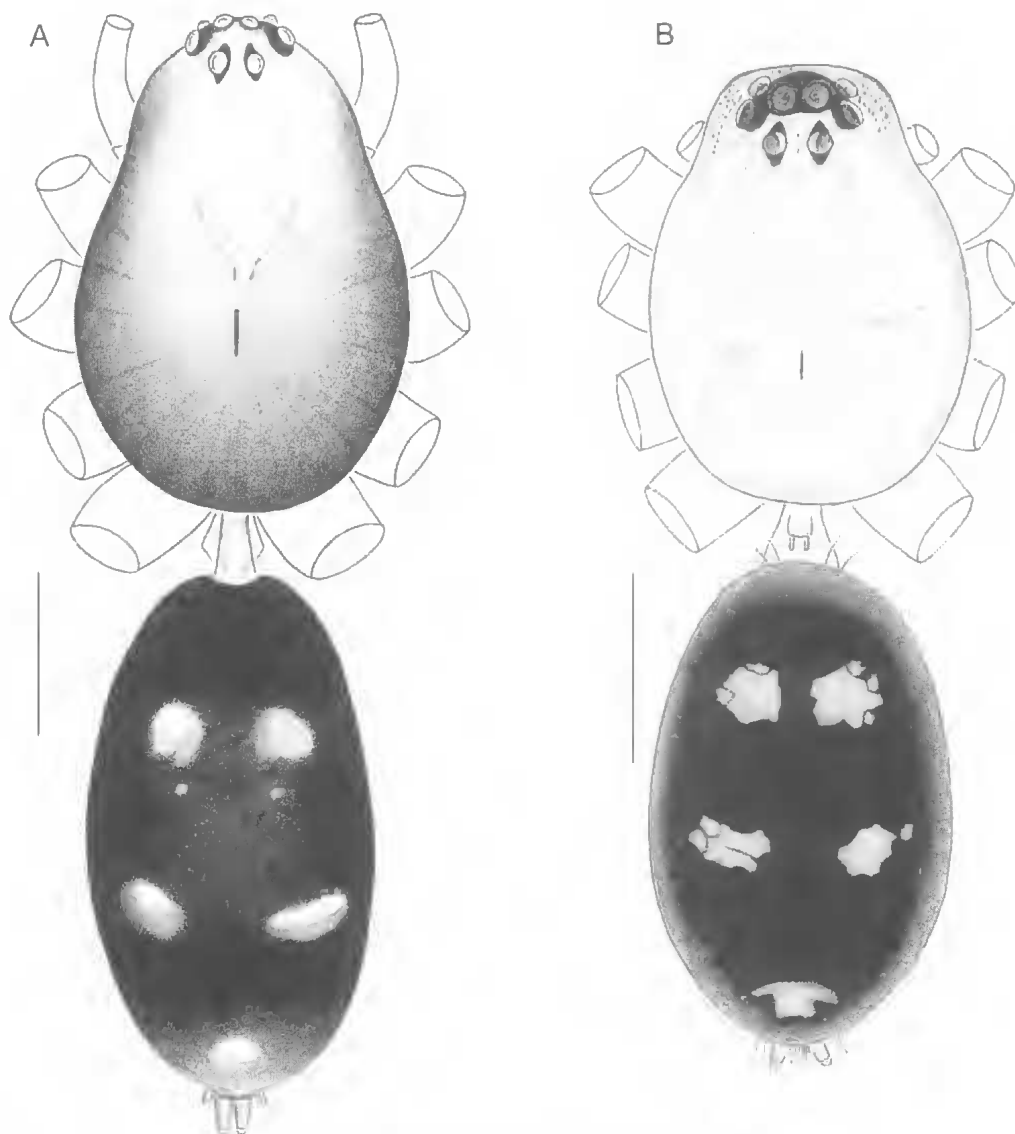


FIG. 10. *Leptasteron*. body dorsal. A, *L. platyconductor*. B, *L. vexillum*. Scale 1mm

Male palp (Fig. 11B,C): tibia with large retrolateral concavity delimited by two apophyses: ventrolateral one, lamellate with blunt, rebordered, frontal extension provided with some large setae; dorsolateral one with proximal, tapered, sharply pointed prong, with triangular tooth at frontal base. Cymbium elongate, dorsoventrally flattened, long, flange fairly long, slightly concave at base; retrolateral ridge provided with hairs standing out. Embolus very long, whip-like, originating on posterior part of tegulum with base pointing backward;

tegulum with long retrolateral ridge, ending in slender proximal knob; VTA large, basal part broad and concave, sharply curved outward at about half its length, ending in long, tapered prong; DTA large, very wide, broadly curved, rebordered along retrolateral edge.

Female unknown.

Variation: the two known males are very similar.

DISTRIBUTION. Known only from type locality.

Leptasteron vexillum sp. nov.
(Figs 10B, 11D,E, 16)

ETYMOLOGY. Noun in apposition; Latin; *vexillum*, flag; referring to the large DTA.

MATERIAL. HOLOTYPE: ♂, Tindery Nature Res., southern entrance, NSW, 35°39'39"S 149°12'43"E, 14.iii.1999, J. Tamawski & S. Lassau, CBCR003-032 (AM KS 55882).

DIAGNOSIS. Males are unique in palp with enormous, terminal folded DTA, very long VTA and long whip-like embolus.

DESCRIPTION. *Male* (holotype). Total length 4.86; carapace 2.24 long, 1.64 wide, tibia+patella 1 2.32.

Colour: Carapace uniform yellow with small dark area on either side above condyle of yellow chelicerae; sternum pale yellow; femora yellow turning to orange distad; rest of legs orange. Abdomen dark grey, with orange tinge above pedicel; with two pairs of white spots and smaller triangular spot in front of spinnerets; sides and venter pale; area in front of epigastric area yellow.

Teguments smooth. Highest point of carapace just behind PME. Carapace and legs provided with sparse but evenly dispersed cover of tiny setae.

Eyes: a: 0.16; b: 0.14; c: 0.14; d: 0.14; e: 0.04; f: 0.04; g: 0.08; h: 0.08; AL-AL: 0.20 MOQ: AW = 1.00 PW; AW = 0.90 L. Clypeus slightly retreating, 0.34 high or 2.5 times diameter ALE.

Chilum single: 0.14 high, 0.18 wide.

Legs: Spination:

	F	P	T	Mt
I	d1	-	v2-2-2	v2-2 dw3
II	d	-	v1-2-2	v2-2 dw3
III	pl2d3rl2	pl1d1rl1	pl2d2rl1v2-2-2	8disp dw5
IV	pl1d3rl1	pl1d1rl1	pl2d2rl2v2-2-2	8disp dw5

Hinged hairs: one dorsal on TI and II.

Epigastric area with triangular indentation. Large sclerotised area in front of tracheal spiracle with pronounced frontal lip. Colulus a row of setae.

Male palp (Fig. 11D,E): tibia with large retrolateral concavity delimited dorsally by long, forward -directed slightly downcurved pointed apophysis, ventrally by slightly shorter, straight, pointed apophysis; prolaterally swollen with 2 macrosetae. Cymbium crescent-shaped, strongly tapered; tegulum with caudal, flattened extension bearing long, whip-shaped embolus which

originates on posterior part of tegulum. Long, slender, outward curved VTA originates on prolateral tegular ridge. DTA large, membranous, broad extremity with large fold accommodating extremities of both VTA and embolus.

Female unknown.

DISTRIBUTION. Known only from type locality.

Subasteron gen. nov.

TYPE SPECIES. *Subasteron daviesae* sp. nov. (Fig. 14) Image from D. Knowles, mentioned in Lindsey (1998) as knobble spider.

ETYMOLOGY. *Subasteron*, is referring to the slightly aberrant somatic morphology of the single species in this genus as compared to other members of the *Asteron*-complex.

DIAGNOSIS. Recognised by the peculiar shape of the cephalothorax which reaches its highest point at the level of the PME and the accordingly high elypeus, up to ten times the diameter of the ALE. Further diagnostic characters are from male palp, first the presence of a prolateral tegular apophysis (PTA) which is unique in the *Asteron*-complex: tibia has a deep retrolateral concavity combined with more or less pronounced concavity on base of cymbium; cymbium has a prolateral basal extension fitting in a concavity with membranous bottom of tibia.

DESCRIPTION. Medium-sized spiders (7.00-9.00) with very finely granulate tegument. Carapace widest at coxae II (Fig. 12A), slightly narrowed to 0.8 maximum width in females, to ca. 0.68 maximum width in males. Profile raised toward front with highest point near PME (Fig. 12C); fovea deeper in males than females.

Colour: carapace and sternum dark brown, chelicerae medium brown; legs with strongly contrasting, white to dark brown segments: coxae pale, trochanters dark, femora dark brown and white, tibiae brown with darker stripes; metatarsi pale, medium brown in distal part in females, uniform dark brown in males; tarsi brownish orange. Abdomen dark with contrasting pattern of white spots and patches. Males darker and with more contrasting pattern.

Eyes (Fig. 12C,D) in 3 rows (2-4-2). ALE only in first row, second with AME (in the middle) and PLE, third with PME. Eyes subequal but ALE smaller than others. MOQ longer than wide. Clypeus slightly concave, high, 6 times ALE in females, 10 times ALE in males; with some setae. Chilum double; separation not complete in

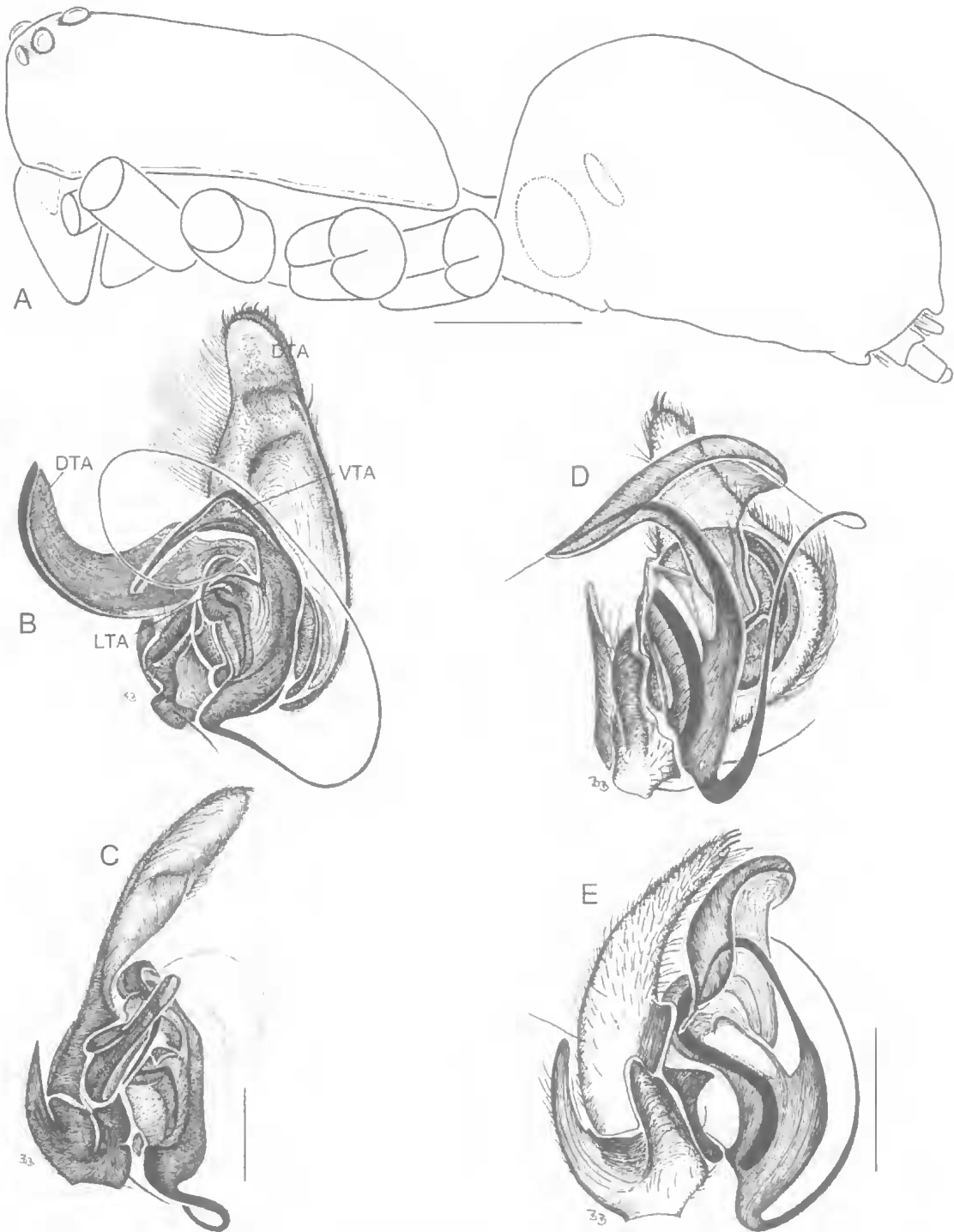


FIG. 11. *Leptasteron* spp. A-C, *L. platyconductor*; A, body lateral; B,C, right male palp; B, ventral; C, retrolateral. *L. vexillum*; D,E, right male palp; D, ventral; E, retrolateral. Scales, C, 1mm; E, 0.5mm. DTA = dorsal tegular apophysis, LTA = lateral tegular apophysis, VTA = ventral tegular apophysis.

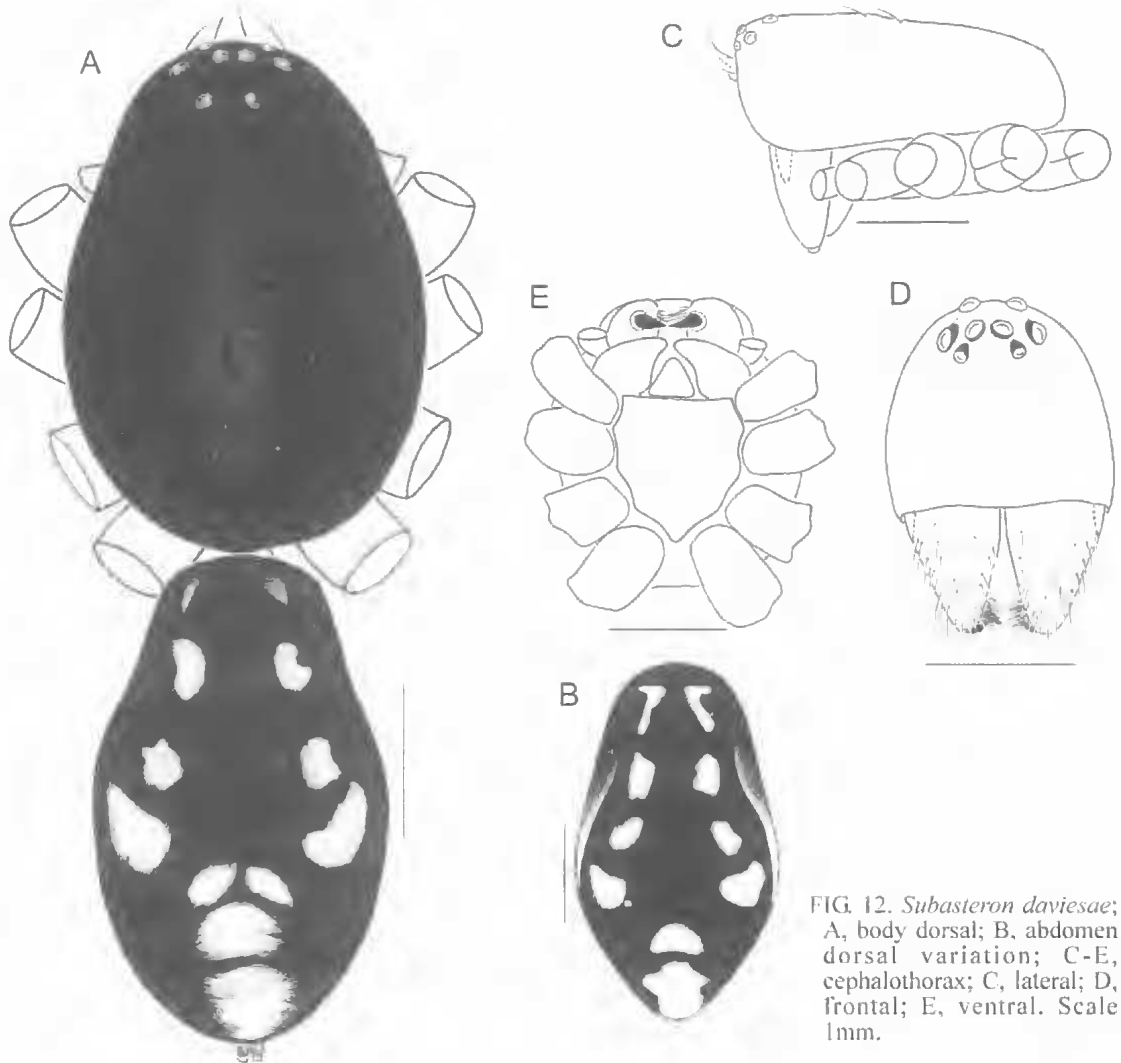


FIG. 12. *Subasteron daviesae*; A, body dorsal; B, abdomen dorsal variation; C-E, cephalothorax; C, lateral; D, frontal; E, ventral. Scale 1mm.

superior half; without setae. Chelicerae as usual in the family with few hairs in front and dense row on distal promargin; no teeth. Labium narrowed at base; sparsely haired. Gnathocoxae rather elongate; sparsely haired; with anteromesal scopula. Sternum flat; triangular with anterior margin slightly concave; with very small triangular extensions between coxae. No inter- nor precoxal sclerites.

Legs: formula 4123. Spination: spines fairly long; up to 4 times of diameter Mt IV in ♂♂, 2.5 times diameter of Mt IV in females; few spines on pairs I and II, more numerous on III and IV. Paired tarsal claws with numerous (12-14) teeth on anterior leg pairs, with slightly fewer on those

of legs III and IV. Unpaired claw toothless, on small onychium.

Trichobothria in 2 rows on T, single row on Mt and t. Hinged hairs few, restricted to dorsal side of TI and II. Metatarsal preening brush on Mt II, III and IV, poorly developed.

Abdomen oval, fairly elongate; in males with marked central dip; with 2 dorsal sigilla, poorly developed elongate frontal sigillum on either side and pair just behind epigastric gold, more strongly developed in ♂♂. Spinnerets: AS, fairly long, slightly conical, with very short distal segment; MS and PS very short, absent in ♂♂. Colulus represented by group of setae. Traacheal spiraele hidden by well developed anterior lip.

Male palp (Fig. 13A-C): tibia with large retrolateral concavity delimited by solid dorsolateral apophysis and ventrolateral apophysis, with swollen lateral margin and frontal tooth. Cymbium with well developed flange and shallow concavity, several spines near distal tip. On prolateral side with basal extension fitting in concavity with membranous bottom of the tibia. Subtegulum strongly developed; partly membranous. Tegulum with broad base carrying transverse section of seminal duct; behind it partly membranous, partly strongly sclerotised; VTA small but strongly sclerotised; with strong prolateral apophysis more or less parallel with embolus. Embolus emerging on prolateral part of tegulum, short, rigid, curved outward. DTA strongly developed, sclerotised. LTA, flat, thorn-shaped.

Epigyne (Fig. 13D,E): strongly sclerotised plate with central depression and roughly rectangular plate with rounded anterior margin. Internal structure obscure due to strong sclerotisation: entrance ducts starting near centre running toward the front then along sides backward enter simple, thick-walled spermathecae near centre. Female palp with finely toothed claw.

***Subasteron daviesae* sp. nov.**
(Figs 12A-E, 13A-E, 14, 16)

ETYMOLOGY. In honour of Val Davies, one of the collectors and in recognition of her important work on Australian spiders.

MATERIAL HOLOTYPE: ♂, SEQ, 3669, Kroombit Tops, Lower Dry Creek, 45 km SSW Calliope, Queensland, 9-19.xii.1983 1000m, open forest, V. Davies & J. Gallon (QM S3669). PARATYPES: Queensland: 4♂ 1♀, together with holotype, 1♂, SEQ, Braemar SF, 27°13'S 150°50'E, 4-8.ii.1980 R. Raven & QM (QM S3668); 1♂ 1♀, SEQ, Kroombit Tops, northern escarpment, 45 km SSW Calliope, 9-19.xii.1983, open forest, v. Davies & J. Gallon (QM S4429); 1♂, xii.1983, B. Jahnke, further as previous (QM S4415); 1♂, SEQ, Clear Mt., Samsonvale Lake, 27.xii.1984, G. Anderson (QM S4275); 2♂, NQ, Cairns, 1968, C. Coleman (AM KS15719); 1♂, SEQ, Numinbah SF, 28°12'S 153°13'E, xi.1979, under bark, T. Robinson (QM S3822); 1♂, SEQ, Fraser Island National Park HQ, 14.x.1978 (QM S3767); 1♂, Stony Ck. via Samford, 27°20'S 152°48'E, 2.II-6.IV.1996, H. Janetzki & G. Monteith (QM S3773); 1♂, SEQ, Clear Mt., Samsonvale, 27.xii.1984, G. Anderson (QMS 4275); 1♂ 1♀, SEQ, Gurgeena Plateau, open forest, 25°27'S 151°22'E, 10.x.-19.xii.1998, intercept trap 360m, 7511, G. Monteith & G. Cough (QM S47507); 1♂, SEQ, Gurgeena Plateau, evergreen forest, 25°27'S 151°23'E, 10.x.-19.xii.1998, intercept trap, 360m 7513, G. Monteith & G. Cough (QM S47508).

DIAGNOSIS. Males have a unique combination of sclerites in palp: particularities of cymbium with a prolateral basal extension and of bulbus with poorly developed VTA, large DTA and mostly very well developed prolateral tegular apophysis (PTA).

DESCRIPTION. *Male* (holotype). Length 7.96; carapace 3.82 long, 2.60 wide; tibia+patella I 4.38.

Colour: carapace dark brown with very faint dark radiating striae and V-shaped dark mark in front of fovea. Chelicerae and sternum medium brown, slightly suffused with black. Coxae pale with dark, distal, prolateral triangles; trochanters medium brown with darker lateral spots; femora each with different contrasting black and white pattern, obliquely divided between upper and lower parts; patellae medium brown, anterior one dorsally pale, second one with pale dorsal spot; tibiae medium brown, first one with pale dorsal side, second and fourth with pale proximal, dorsal spot; metatarsi medium brown, paler towards proximal end; tarsi yellowish orange. Abdomen dark sepia to black; dorsum with 10 pale spots, 8 in 4 pairs, 2 in front of spinnerets; frontal pair reniform, second and third pair small and oval, fourth pair large, rounded; central spots in front of spinnerets elongate; sides with large, oblique, drop-shaped white patch; venter with a pair of rounded white spots on pale sepia background.

Carapace and sternum smooth.

Eyes: a: 0.10; b: 0.14; c: 0.18; d: 0.18; e: 0.04; f: 0.16; g: 0.20; h: 0.24; AL-AL: 0.26. MOQ: AW = 0.71 PW; AW = 0.63L.

Clypeus: 1.0 or 7.1 times diameter of AL. Chilum double each part 0.32 large, 0.14 high.

Legs: Spination:

	F	P	I	III
I	pl1a3r1	pl1	pl2v2-2-2	dw3
II	pl3a4r3	pl1	pl1v2-1-2	dw3
III	pl4d4r3	pl2r1	pl2d2r2v2-2	8d1sp dw6
IV	pl2d3r1	pl2e1	pl2d2r1v2-2-2	10disp dw5

One dorsal hinged hair on tibiae I and II. several macrosetae on ventral femora.

Male palp (Fig. 13A-C): tibia with large retrolateral concavity delimited by swollen ventrolateral apophysis provided with pointed anterior part; dorsolateral apophysis with slightly ridged prong directed forward. Cymbium with well developed rebordered flange. Embolus fairly short and rigid, well delimited from

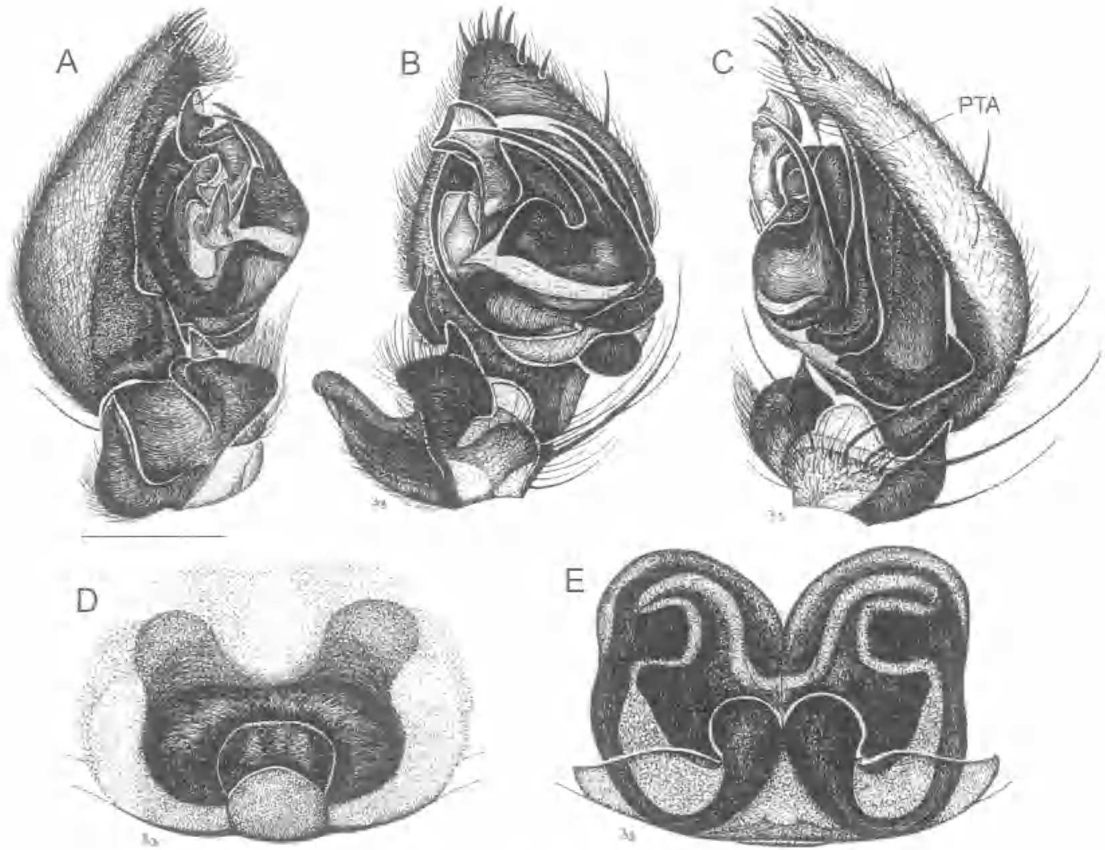


FIG. 13. *Subasteron daviesae*. A-C, right male palp; A, ventral; B, retrolateral; C, prolateral; D,E, epigyne; D, ventral; E, dorsal. Scales 0.5mm. PTA = prolateral tegular apophysis.

tegulum; VTA hardly developed, nothing more than a shallow prominence near base of embolus; LTA a membranous thorn-like appendage; DTA broad, curved, broadened towards extremity, concave in ventral view; PTA well developed, originating on dorsal part of tegulum separated from ventral part by shallow cleft; shape similar to that of embolus, but no embolar apophysis, like in *Pentasteron* ssp.

Female (Fig. 13D,E). Total length 9.00; carapace 3.60 long, 2.40 wide; tibia+patella I 3.30.

Colour: very much as in male but less dark and contrast less strong. Palp pale yellow with distal part of femur and tarsus medium brown.

Carapace and sternum smooth.

Eyes: a: 0.14; b: 0.12; c: 0.14; d: 0.16; e: 0.06; f: 0.12; g: 0.22; h: 0.22; AL-AL: 0.30. MOQ: AW = 0.64 PW; AW = 0.64.

Clypeus: 1.11 or 9.2 times diameter of ALE. Chilum double each part 0.42 large, 0.16 high.

Legs: Spination:

	F	P	T	Mt
I	pl1d3rl1	-	pl1v2-2-2	v2-2-2dw3
II	pl3d3rl2	pl1	pl1v1-2-2	v2-1-1-1dw3
III	pl4d4rl3	pl2rl1	pl2d2rl2v2-2-2	8disp dw6
IV	pl2d4rl1	pl2rl1	pl2d2rl3v2-2-2	10disp dw5

One dorsal hinged hair on tibiae I and II, several macrosetae on ventral side of femora.

Epigyne (Fig. 13D,E): central part strongly sclerotised and almost black, provided with two narrow copulatory openings; posteriorly with paler part. Copulatory ducts run around epigyne margin, ending in small touching spermathecae.

Variation: male size stable TL: 6.9-8.0; carapace length: 3.2-3.9, carapace width: 2.4-2.7. Colour pattern with slight variations; dorsal spots in front of spinnerets sometimes with transverse or longitudinal divisions or sometimes completely fused and forming one large white patch. Clypeus in male up to 10 times diameter of



FIG. 14. *Subasteron daviesae*, body dorsal, slide from Knowles.

ALE; discrepancy is mainly due to delimitation of ALE since height of clypeus appears stable.

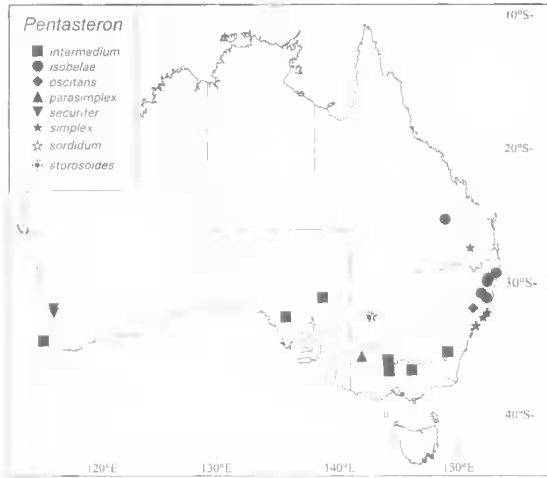
DISTRIBUTION. Queensland.

DISCUSSION

Including species described herein, the *Asteron*-complex now contains 37 species in 7 genera. *Asteron mas* Jocqué, 1991 was not included in the revision of *Asteron* ss. as it belongs in another genus of the complex but keeps its binomen until the new speciose genus where it belongs is described.

As stated in the introduction separation of the genera erected herein was problematic. Phylogenetically basal taxa are often difficult to define due to the lack of synapomorphies. Jocqué (1991) described a number of Australian zodariid genera almost exclusively based on palpal morphology. Jocqué (1995a,b) erected a few more genera and

foreshadowed more supraspecific taxa for the wealth of Australian zodariids. Definition of the genera will continue to be almost exclusively based on genitalia. Somatic characters are often stable within these taxa but they do not offer a reliable base, as they appear to be plesiomorphic or extremely homoplastic characters. Examples in the present paper are the shape of the carapace (clypeus height), and of the chilum (single, double), eye arrangement (proportions of MOQ), colour pattern, shape of tracheal spiracle. Definition of genera in the Australian zodariids and in that family in general, has therefore mainly been based on genitalia. Yet, the epigyne of these species is especially hard to study, mainly because of the thickness and strong sclerotisation of its internal structure. Also the epigyne is usually structurally simple offering few characters. In this group, ♂ palps therefore

FIG. 15. Records of *Pentasteron* species in Australia.

remain the main characters to define species and genera. Great care has to be taken to use appropriate characters as it now becomes clear that increase in complexity (defined as addition of apophyses and modifications) is a general phenomenon and proceeds in parallel in many, if not all spider taxa (Jocqué 1998). General characters such as 'long and flexible embolus', 'bilid embolus' should therefore be avoided. They tend to appear over and again in the course of the evolution of the palp. Appearances of new sclerites (e.g. the prolateral tegular apophysis in *Subasteron*, the basal cymbial concavity combined with the tibial concavity in *Pentasteron*) are more likely to be reliable generic discriminators. The character on which *Phenasteron* is based, the size and shape of the DTA, is less reliable because amplification of an apophysis is evidently less drastic than the addition of a new structure.

ACKNOWLEDGEMENTS

We thank M. Gray, M. Harvey, R. Raven and J. Waldoek for the loan of material. We are indebted to M. Baehr, K. Brennan and J. Shield for giving additional material, A. Reysel for his skillful habitus drawings and D. Knowles for image of *Subasteron daviesae*. We are specially grateful to R. Raven for the preparation of the distribution maps. This work was supported by the Australian

FIG. 16. Records for species of *Leptasteron*, *Phenasteron* and *Subasteron* in Australia.

Biological Resources Study Participatory Program.

LITERATURE CITED

- BAEHR, B. & JOCQUÉ R. 1996. A revision of *Asteron* starring male palpal morphology. *Revue Suisse Zoologie*, hors série: 15-28.
2000. Revisions of genera in the *Asteron*-complex (Araneae, Zodariidae). The new genera *Cavasteron* and *Minasteron*. *Records of the Western Australian Museum* 20: 1-30.
- JOCQUÉ, R. 1991. A generic revision of the spider family Zodariidae (Araneae). *Bulletin of the American Museum of Natural History* 201: 1-160.
- 1995a. Notes on Australian Zodariidae (Araneae), I. New Taxa and Key to the Genera. *Records of the Australian Museum* 47: 117-140.
- 1995b. Notes on Australian Zodariidae (Araneae), II. Redescriptions and new records. *Records of the Australian Museum* 47: 141-160.
1998. Female choice, secondary effect of 'mate check'? A hypothesis. *Belgian Journal of Zoology* 128: 99-117.
- JOCQUÉ, R. & BAEHR, B. 2001. Revisions of genera in the *Asteron*-complex (Araneae, Zodariidae). A revision of the genus *Asteron* with description of the new genus *Pseudasteron*. *Records of the Australian Museum* 53(1): 21-36.
- LINDSEY, T. 1998. *Green guide to spiders of Australia*. (New Holland: Frenchs Forest, Sydney).

A REVIEW OF *TEMNOSEWELLIA* (PLATYHELMINTHES: TEMNOCEPHALIDA)
ECTOSYMBIONTS OF *CHERAX* (CRUSTACEA: PARASTACIDAE) IN AUSTRALIA

LESTER R.G. CANNON AND KIM B. SEWELL

Cannon, L.R.G. & Sewell, K.B. 2001 06 30: A review of *Temnosewellia* (Platyhelminthes) ectosymbionts of *Cherax* (Crustacea: Parastacidae) in Australia. *Memoirs of the Queensland Museum* 46(2): 385-399. Brisbane. ISSN 0079-8835.

New species are described and existing species reviewed of *Temnosewellia*, worms living ectosymbiotically on parastacid crayfish, *Cherax* spp., in Australia. □ *Temnosewellia*, *Cherax*, *Australia*, *ectosymbionts*, *crayfish*.

Lester R.G. Cannon and Kim B. Sewell, *Queensland Museum, PO Box 3300, South Brisbane 4101, Australia; 3 June 2000.*

Temnocephalida are dalyellioid rhabdocoels found as ectosymbionts, especially on freshwater crustaceans; they are characterised by a syncytial epidermis divided into a series of plates and a tendency to lose locomotory ciliation (Cannon & Joffe, 2001). Cannon (1986) recognised three families, Scutariellidae from prawns in Europe and Asia, the monotypic Actinodactylellidae from burrowing crayfish from southern Australia and the Temnocephalidae — a large and diverse family with Gondwanan associations. Sewell & Cannon (1996) resolved the position of controversial *Didymorchis*, i.e. in the Temnocephalida and within the Didymorchidae Bresslau & Reisinger, 1933. Cannon & Joffe (2001) also recognised Diceratocephalidae to include *Diceratocephala* and *Decadidymus*, each with two anterior tentacles.

By far the largest and most diverse family, Temnocephalidae, was first recorded in Australia in 1888 with *Temnocephala fasciata* Haswell, 1888 and *T. minor* Haswell, 1888 from the crayfish *Astacopsis serratus* (Shaw, 1794) and *A. bicarinatus* Gray, 1845, respectively. Today these crayfish are known to be several species, respectively in the genera *Euastacus* and *Cherax*. Haswell (1893) added temnocephalans from *A. bicarinatus* (i.e. *Cherax*), viz. *Temnocephala dendyi* Haswell, 1893 and *Craspedella spenceri* Haswell, 1893. Cannon & Sewell (1995) reviewed *Craspedella* adding new species and genera and recognising the subfamily Craspedellinae. With the exception of *Dactylocephala* from Madagascar which shows some differences (Cannon & Sewell, 2001), the remaining genera recorded within the Temnocephalidae, viz. *Temnocephala*, *Temnohaswellia*, *Temnomonticellia*, *Notodactylus*, *Achenella* and *Craniocephala* all display a similar facies and may be assigned confidently to the subfamily Temnocephalinae.

The largest genus, *Temnocephala*, has species found on a wide variety of hosts. Recently, Damborenea & Cannon (2001) reviewed members of this genus from the Neotropics and concluded that the Australian representatives should be separated as *Temnosewellia*. Here we review *Temnosewellia* from *Cherax* spp. crayfish in Australia.

Collection and processing of crayfish and worms and morphological terminology follow Cannon & Sewell (1995). All worms were highly mobile on crayfish, and unless otherwise stated, worms were recorded as collected on the surface of the crayfish exoskeleton. Several species of worms were commonly found in the branchial chamber of their crayfish hosts, but none were located there exclusively.

Recognition that the cirrus is a most effective discriminator of species has led to taxonomic descriptions that are more succinct than in previous reports (Cannon & Sewell, 1995; Sewell & Cannon, 1998). In addition, many of the specimens we examine here were collected prior to our adoption of improved techniques requiring the use of live worms, i.e. the use of de Faure's fluid to elucidate the structure of the cirrus, and the use of silver nitrate to examine the epidermal mosaic (Cannon & Sewell, 1995; Sewell & Cannon, 1998).

TERMINOLOGY AND MEASUREMENTS

Specimen data are listed in the order: QM registration number; specimen/slide preparation details (in parentheses); host scientific name; locality details; date collected; collector(s); histological fixation/staining procedures. Full registration details are provided for each holotype specimen and for each new locality. For all subsequent specimens listed in the Materials